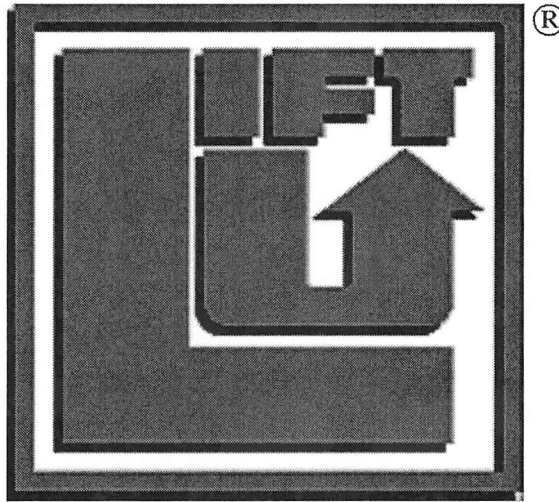


# LIFT-U<sup>®</sup>

A DIVISION OF HOGAN MFG., INC.



---

## TECHNICAL REFERENCE MANUAL

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**MODEL NUMBER: LU10-61-01 (L351)**

**STYLE: PLATFORM LIFT**

**COACH: ORION**

**ALEXANDRIA TRANSIT**

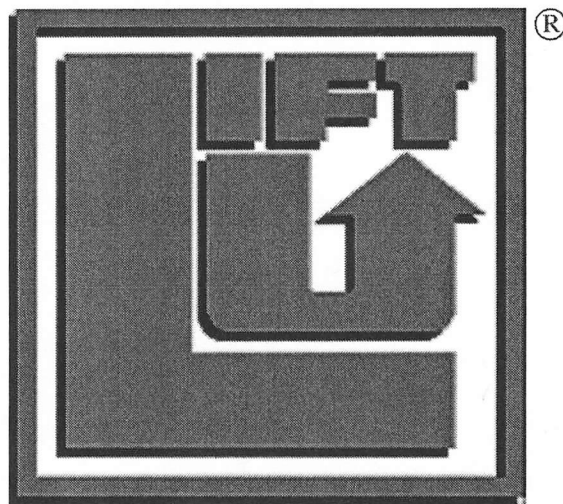
**ALEXANDRIA, VA**

**DOT PUBLIC USE LIFT**

*The statement "DOT Public Use Lift" verifies that this platform lift meets the "public use lift requirements" of FMVSS No. 403. This lift may be installed on all vehicles appropriate for the size and weight of the lift, but must be installed on buses, school buses, and multi-purpose passenger vehicles other than motor homes with a gross vehicle weight rating (GVWR) that exceeds 4536 kg (10,000 lb.)*

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### ***How to get around...***

- Use your computer mouse to **click & go**. Each page (excluding the Front Cover and Drawings) will open with a bookmark window to the left of the screen. Bookmarks are linked to the appropriate area within this manual. Simply **click & go** (only one mouse click is required).
- The **Table of Contents** and **Illustrated Parts Index** pages are recommended as starting points to locate information contained within this manual.
- At the bottom of each page are **Navigation Control Buttons** (*reference the buttons at the bottom of this page*). Use these buttons to go to the primary sections of this manual. Simply **click & go**.
- **Search** and **Print** functions are also just a click away.
- Each assembly drawing includes a Single Level Bill (SLB) of parts that make up the assembly. Dragging the mouse pointer over a drawing balloon number will display the item information at the top of the drawing. Many users will find this to be a handy tool for identifying part numbers.
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#### **System Requirements for Acrobat Reader 4.0 Windows**

- i486 or Pentium processor-based personal computer
- Microsoft Windows 95, Windows 98, or Windows NT 4.0 with Service Pack 3 or later
- 8 MB of RAM on Windows 95 and Windows 98 (16 MB recommended)
- 16 MB of RAM on Windows NT (24 MB recommended)
- 10 MB of available hard disk space



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## MODEL SPECIFICATION

MODEL: LU10-61-01

S/N PREFIX: L351

BUS SYSTEM NAME: ALEXANDRIA TRANSIT (ALEXANDRIA, VA)

### GENERAL

LIFT OPERATION DRAWING: 199-0061  
MAXIMUM LOAD: 600 LBS.  
RAMP / BARRIER, BARRIER ANGLE: 90.0 DEG., + 5 DEG.  
BRIDGE / BARRIER, BARRIER ANGLE: 84.0 DEG., +/- 2 DEG.

703-370-3404  
703-823-0591

### CYCLE TIMES

STOWED TO DEPLOYED: 6 - 10 SECONDS  
DEPLOYED TO STOWED: 6 - 10 SECONDS  
GROUND TO FLOOR LEVEL (INCLUDING BARRIER): 8 - 18 SECONDS (WITH LOAD)  
GROUND TO FLOOR LEVEL (INCLUDING BARRIER): 8 - 18 SECONDS (NO LOAD)  
FLOOR TO GROUND LEVEL (INCLUDING BARRIER): 8 - 18 SECONDS (WITH LOAD)  
FLOOR TO GROUND LEVEL (INCLUDING BARRIER): 8 - 18 SECONDS (NO LOAD)

Diane Alex VA  
Spec 1  
AW 32

A H4  
Aviation  
011

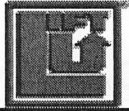
### HYDRAULIC SYSTEM

SCHEMATIC: 291-0102  
SOURCE: ELECTRICALLY DRIVEN MOTOR / HYDRAULIC POWER UNIT  
HYDRAULIC RELIEF: 1250 PSI, +/- 25 PSI  
FLUID FLOW RATE: 2.4 GPM AT 1250 PSI (24V SYSTEM)  
FLUID TYPE: MIL. SPEC. H5606 A OR E AVIATION FLUID  
FLUID LEVEL: ¾ FULL RESERVOIR AT STOW LEVEL (MINIMUM)  
FILTRATION: 10 MICRON PRESSURE

Paradent  
AW 32

Low Temp  
Exxon

#1009  
D  
17



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## MODEL SPECIFICATION

**MODEL:** LU10-61-01

**S/N PREFIX:** L351

**BUS SYSTEM NAME:** ALEXANDRIA TRANSIT (ALEXANDRIA, VA)

### ELECTRICAL SYSTEM

**WIRING DIAGRAM:** 391-0123

**VOLTAGE:** 20 – 27.0 VDC (24V SYSTEM)

**CURRENT, ELECTRICAL LOGIC:** 4 AMP. MINIMUM (24V SYSTEM)

**LIMIT SWITCHES:**  
(1) SHORT TRAVEL  
(1) BI-DIRECTIONAL

**PROXIMITY SENSORS:** (7) 18MM PROXIMITY SENSORS

**SENSITIVE MATS:**  
(2) PLATFORM SURFACE  
(1) RAMP BARRIER  
(1) BUS THRESHOLD AREA

**SENSITIVE EDGES:** (2) TOP SURFACE, EDGE GUARDS

### LUBRICATION

**(LIFT MASTER, SLAVE, STOW/DEPLOY PRIMARY AND SECONDARY) CHAINS:** CHAIN LUBE (P/N 515-0014)

**FLANGE BEARINGS AND BUSHINGS:** NO LUBRICATION REQUIRED

**TORQUE SHAFT CRUTCH:** MULTI-PURPOSE LITHIUM GREASE

**(CLEVIS PINS, GUIDE AND LINKAGE PINS) ROADSIDE/CURBSIDE BARRIERS:** CHAIN LUBE (P/N 515-0014)

**(CLEVIS PINS) LIFT CYLINDERS:** CHAIN LUBE (P/N 515-0014)

**(CLEVIS PINS) STOW LATCH:** CHAIN LUBE (P/N 515-0014)

**LIFT PLATFORM TRUNNIONS AND PIVOT POINTS:** NO LUBRICATION REQUIRED

**BARRIER HINGE AND HINGE PINS:** NO LUBRICATION REQUIRED

**STOW LATCH FACE:** DOOR-EAZE



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## **SPARE PARTS ORDERING PROCEDURE**

The **LIFT-U®** lift mechanism and attached parts are an engineered product. Consequently, the use of replacement parts that are not of the proper quality specifications will affect safe lift operation. Use only replacement parts that are authorized by **LIFT-U®, DIVISION OF HOGAN MFG., INC.** The use of parts not authorized by the company could degenerate the performance of the lift mechanism, which in turn could endanger the lift passenger as well as service personnel.

**Standard and emergency parts orders may be placed by the following methods:**

**1. Written order**

LIFT-U®  
Division of Hogan Mfg., Inc.  
P.O. Box 398  
Escalon, CA 95320-0398

Attn: Parts Department

**2. Telephone order**

Phone Direct: (209) 552-8636 or (209) 552-8684  
For Operator Dial: (209) 838-2400

**3. Fax order**

Fax: (209) 838-8922  
Attn: Parts Department

**4. E-Mail**

Richricker@hoganmfg.com

## **SHIPPING, BILLING AND FREIGHT INFORMATION**

1. Pricing, billing and freight procedures may change without prior notice.
2. All orders are shipped **F.O.B.** origin.



### PURPOSE

This illustrated service/parts manual has been produced for the express purpose of providing technical support for service and repair of the LIFT-U® lift. All text, illustrations and lists specifically pertain to the particular model lift presented herein. This manual should not be used to service or replace any other model lift, as various model lifts may require different procedures, parts, and adjustments.

It is not our intention to cover all maintenance, service and adjustment contingencies herein. Only general problem solving and/or theory of operation relevant to the specific model are described in this manual.

In most cases, the illustrated service parts/assemblies have been drawn using illustrations of the specific parts listed for this unit only. However, in some instances, due to revision, redesign, or use of optional service parts, an illustration may no longer represent an assembly part accurately. In those instances, revised data will be issued for inclusion into this manual. All revised parts and/or service parts/assembly lists directly supersede all pre-existing literature. Therefore, all replaced pages should be destroyed to avoid the inadvertent use of outdated information.

This manual has been prepared exercising our best skills and judgment according to the best of our knowledge and belief, based on information gathered from sources believed to be reliable. This manual is not an assumption or undertaking on behalf of or for the benefit of the customer or others by LIFT-U®, DIVISION OF HOGAN MFG., INC. of obligations imposed upon the customer by any statute, law, regulation, or legal decision.

**The service procedures provided herein are purely advisory in nature. The selection and development of appropriate service measures, their implementation, and their frequency are the sole obligation and responsibility of the customer.**

No representation is made or intended that all necessary safety recommendations are contained in this manual, or that other or additional measures may not be required under particular or exceptional conditions or circumstances.

If, for any reason, there is a question regarding the proper use of tools, parts, or procedures within this publication, please contact your field service representative, or:

#### **LIFT-U® DIVISION OF HOGAN MFG., INC.**

1704 First & Coley Streets  
P.O. Box 398  
Escalon, CA 95320-0398

Phone: (209) 838-2400  
Fax: (209) 838-7329





### GENERAL DESCRIPTION

The **LIFT-U®** LU10 is an electrically controlled, hydraulically powered, chain driven lift system that fits under the front or rear stepwell of the bus and replaces the bottom step. The lift system is designed to transport wheelchair passengers with or without an able-bodied attendant into and out of a bus. It is also designed for the powered transport of standing mobility-impaired passengers.

The complete lift system components may include several bus-side components that may or may not be described or covered in this manual. Bus-side components may include, but may not be limited to: the power steering hydraulic system, hydraulic oil reservoir, diverter valve system, instrument panel electrical controls, interlock and interlocking systems and dash controls. For information regarding systems not covered in this manual, consult bus manufacturer.

The lift platform is a rigid structure that is supported by four parallel side arms. These side-arms form twin parallelograms, and ensure that the lift platform remains parallel to the floor of the bus at all times. Steel handrails are a part of this structure for safety of the rider when the lift is in use and for the safety of other passengers when it is not. A barrier at the curbside end of the platform tilts up prior to the platform raising or lowering, to prevent an uncontrolled exit while the lift platform is off the ground. The barrier is up in all lift positions or modes in which the platform is off the ground. It is down forming a ramp from the platform's surface when the unit is extended and on the ground for boarding or de-boarding the lift platform. A barrier at the roadside end of the platform provides a similar safety feature as the curbside barrier. The roadside barrier is in the barrier position at all times when the lift is in use except when the lift platform is at coach floor level. In this case, the roadside barrier forms a bridge to the coach floor.

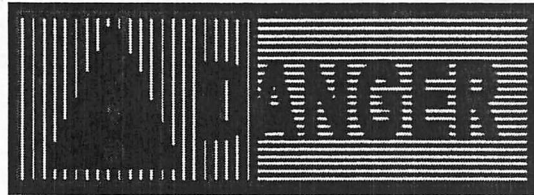
The system requires both electric and hydraulic power to move in any direction. This enhances the safety of the passenger, for an electrical or hydraulic failure will stop the unit in whatever position it is in at the moment of malfunction. Even loss of hydraulic pressure will not cause the lift platform to lower at greater than acceptable speed.

**NOTE:** The **LIFT-U®** lift is designed to operate for a period of twelve (12) years from the date manufactured. At such time the lift must be removed from service. If the coach is still operational the lift must be replaced or disassembled, inspected and rebuilt with **LIFT-U®** approved parts and to **LIFT-U®** specifications.

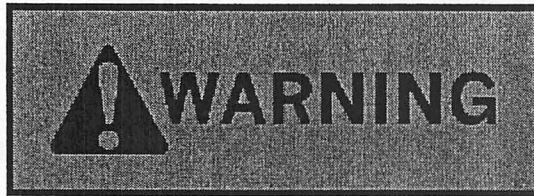


### SAFETY NOTICES

Warning notice panels are used throughout this manual to notify personnel of hazards that are associated with the lift unit and its service procedures. Each warning notice will use a "signal word" panel to indicate the seriousness of the hazard. The signal word panels are shown and defined below:



THIS SIGNAL PANEL INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THIS PANEL IS TO BE LIMITED TO THE MOST EXTREME SITUATIONS.



THIS SIGNAL PANEL INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.



THIS SIGNAL PANEL INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MODERATE OR MINOR INJURY. IT MAY ALSO BE USED TO ALERT AGAINST UNSAFE PRACTICES OR POTENTIAL EQUIPMENT DAMAGE.

Each warning notice will:

1. Use the signal word panel to indicate severity of the hazard.
2. Describe the hazard with a drawing (pictogram) and/or text.
3. Give instructions (**in bold**) for preventing or avoiding the hazard.
4. Describe what could occur if the instructions are not followed.



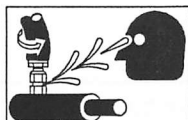
### SAFETY NOTICES - SERVICE AND REPAIR

Proper service and repair is critical for the operation of any hydraulically powered unit. The procedures described in this manual are reliable service operations. Some procedures may require specifically designed tools. For such procedures, use only the tools specified. The use of any other tool may be dangerous and could lead to serious injury.

This manual contains information relevant to the safe operation, maintenance, and repair of the lift system only. This manual does not contain information about bus-side features such as interlocks, door clearance, and proper lift installation. Consult the bus manufacturer for bus-side information.

Maintenance personnel and operators must familiarize themselves with the **LIFT-U®** system, operating procedures, and precautions before operating the lift. The following list of safety precautions must be read, understood, and observed at all times.

#### SAFETY PRECAUTION 1



HYDRAULIC OIL, AT PRESSURE UP TO 2000 PSI, COULD SPRAY INTO THE EYES, ONTO THE SKIN, OR INTO THE BODY WHEN ATTEMPTING TO REMOVE LIFT HYDRAULIC COMPONENTS WHILE THEY ARE PRESSURIZED. THE LIFT COULD MOVE AND CRUSH PERSONNEL OR OBJECTS WHEN ANY LIFT HYDRAULIC CIRCUIT IS OPENED. PUMPING MUST BE DISCONTINUED AND ALL PRESSURE RELIEVED BEFORE ATTEMPTING TO REMOVE ANY HYDRAULIC COMPONENTS. DO NOT ATTEMPT TO OPEN THE HYDRAULIC SYSTEM OR REMOVE COMPONENTS UNLESS THE LIFT IS LATCHED WITHIN THE SLIDE CHANNELS, DEPLOYED AND LOWERED TO THE GROUND, OR PLACED SECURELY ON SUPPORTS. THE LIFT MUST BE PLACED IN A STABLE, SECURE POSITION BEFORE RELEASING HYDRAULIC PRESSURE. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY FROM OIL SPRAYING INTO THE EYE, HOT OIL BURNS, OIL INJECTED INTO THE BODY, HOSE WHIPPING, AND/OR BEING CRUSHED/PINCHED BY THE LIFT.

#### SAFETY PRECAUTION 2



MAINTENANCE PERSONNEL COULD BE PINCHED OR CRUSHED BY MOVING PARTS OF THE LIFT UNIT WHEN IT IS OPERATING. BEFORE AND DURING OPERATION OF THE LIFT, KEEP ALL PERSONNEL CLEAR OF PARTS THAT COULD MOVE. PERSONNEL NEAR THE LIFT DURING OPERATION COULD BE SERIOUSLY INJURED IF THEY BECOME ENTANGLED, PINCHED, OR CRUSHED BY THE UNIT.



### SAFETY NOTICES - SERVICE AND REPAIR (continued)

#### SAFETY PRECAUTION 3



THE LIFT UNIT, AND SOME OF ITS COMPONENTS, ARE HEAVY AND AWKWARD TO HANDLE AND MAY BE DROPPED OR MISHANDLED DURING CERTAIN MAINTENANCE PROCEDURES IF ATTEMPTED BY ONE TECHNICIAN. SOME MAINTENANCE PROCEDURES REQUIRE TWO TECHNICIANS AND/OR REQUIRE EQUIPMENT TO SAFELY PERFORM THE TASK. WHENEVER HEAVY/AWKWARD COMPONENTS ARE TO BE HANDLED, OR WHENEVER SPECIFIED IN THIS MANUAL, EXTRA TECHNICIANS AND/OR LIFT ASSISTING EQUIPMENT SHOULD BE USED TO SAFELY MOVE THE COMPONENTS. HANDLING HEAVY OR AWKWARD COMPONENTS ALONE MAY RESULT IN BACK INJURY, CRUSHING OF LIMBS IF THE OBJECT IS DROPPED, OR DAMAGE TO THE COMPONENTS.

#### SAFETY PRECAUTION 4



THE LIFT UNIT AND ITS COMPONENTS MAY FAIL IF NOT REGULARLY MAINTAINED TO SPECIFICATIONS PROVIDED IN THE MAINTENANCE SCHEDULE. REGULARLY MAINTAIN, INSPECT, AND ADJUST THE LIFT UNIT AND ITS COMPONENTS IN ACCORDANCE WITH THE SPECIFIED MAINTENANCE SCHEDULE. AN IRREGULARLY MAINTAINED UNIT MAY FAIL OR OPERATE UNSAFELY. THIS MAY INJURE PASSENGERS OR TECHNICIANS AND UNNECESSARILY DAMAGE THE LIFT UNIT.

#### SAFETY PRECAUTION 5



EXCEEDING THE LIFT MECHANISM DYNAMIC LOAD CAPACITY COULD CAUSE THE LIFT TO FAIL. DO NOT EXCEED THE LIFT MECHANISM LOAD CAPACITY AND DO NOT OPERATE THE LIFT WHEN IT IS OVERLOADED. AN OVERLOADED CONDITION COULD CAUSE THE LIFT PLATFORM OR OTHER COMPONENTS TO FAIL AND PASSENGERS OR MAINTENANCE PERSONNEL TO FALL FROM THE LIFT MECHANISM. PERSONNEL OR PASSENGERS COULD BE SERIOUSLY INJURED AND EQUIPMENT DAMAGED IF THE LIFT MECHANISM IS OPERATED IN AN OVERLOAD CONDITION.

#### SAFETY PRECAUTION 6



THE STANDING MOBILITY IMPAIRED PASSENGERS MUST BE AWARE OF LOW OVERHEAD CLEARANCE. PEOPLE STANDING ON THE LIFT PLATFORM COULD LOSE THEIR BALANCE OR STRIKE THEIR HEADS AND FALL FROM THE LIFT PLATFORM. LIFT PASSENGERS COULD BE SERIOUSLY INJURED BY A FALL FROM THE LIFT PLATFORM.



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# Section 1

## GENERAL INFORMATION

### SAFETY NOTICES - SERVICE AND REPAIR (continued)

#### SAFETY PRECAUTION 7



THERE IS A LIMITED AMOUNT OF SPACE UNDER THE BUS AND/OR LIFT. TO REDUCE THE POSSIBILITY OF PERSONAL INJURY, DO NOT GO UNDER THE BUS TO SERVICE OR REPAIR THE LIFT WITHOUT FIRST PLACING SUPPORT JACKS UNDER THE BUS AND/OR LIFT. THE LIFT ASSEMBLY PACKAGE WEIGHS APPROXIMATELY 1000 POUNDS AND IS AWKWARD TO MANIPULATE OR LIFT. IF THE LIFT PACKAGE DROPS, PERSONNEL BENEATH IT COULD BE SERIOUSLY INJURED AND THE LIFT COULD BE DAMAGED.

#### SAFETY PRECAUTION 8



IF INSTRUCTIONS WITHIN THIS MANUAL CONFLICT WITH SAFETY STANDARDS OR SERVICE METHODS PRESCRIBED BY THE BUS MANUFACTURER, DO NOT PROCEED UNTIL THE BUS MANUFACTURER AND/OR A LIFT-U® SERVICE REPRESENTATIVE CAN CLARIFY THE CORRECT PROCEDURE. ANYONE WHO CHOOSES TO USE A TOOL OR PROCEDURE NOT SPECIFIED IN THIS MANUAL MUST ASSESS THE POTENTIAL DANGER OF SUCH ACTION. IN ALL CASES, PERSONS MUST SATISFY THEMSELVES THAT WHAT THEY ARE ABOUT TO DO WILL NOT JEOPARDIZE THEIR SAFETY, THE SAFETY OF OTHERS, OR THE SAFETY OF THE VEHICLE SYSTEM.





### THEORY OF OPERATION

The following are definitions of the commonly used terms in this manual.

**outer barrier** – Device located at the curbside edge of the platform capable of the following actions:

1. Forming the first step of the bus (step position).
2. Preventing a passenger from rolling off the curbside edge of the platform (deployed).
3. Providing a transition from the ground to the platform surface (ramp position).

The outer barrier is also known as the curbside barrier.

**inner barrier** – Device located at the roadside edge of the platform capable of the following actions:

1. Preventing a passenger from rolling off the roadside edge of the platform (deployed).
2. Providing a transition from the coach threshold to the platform surface (bridge position).

The inner barrier is also known as the roadside barrier.

**ramp position** – The position of the outer barrier suitable for passenger loading and unloading

**step position** – The position of the outer barrier when the lift is in a stowed position (the first step of the bus).

**bridge position** – The position of the inner barrier suitable for passenger loading and unloading, also the position necessary for the lift to stow.

**stowed position**

1. With respect to the platform – a position maintained during normal vehicle travel
2. With respect to the outer barrier – also known as the step position
3. With respect to the inner barrier – also known as the bridge position

**deployed position**

1. With respect to the platform – any position between floor and ground and the lift fully extended.
2. With respect to the outer barrier – a position that prevents a passenger from rolling off the curbside edge of the platform (barrier position).
3. With respect to the inner barrier – a position that prevents a passenger from rolling off the roadside edge of the platform (barrier position).





### THEORY OF OPERATION

The **LIFT-U®** LU10 lift is operated by electrical circuits from dash or pedestal mounted control switches. The electrical circuits are comprised of solid-state source drivers that power solenoid operated directional control valves. These solid-state source drivers are keyed by the limit and/or proximity switches mounted to the lift mechanism.

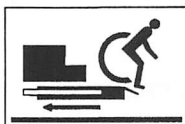
Electrical power is made available to the lift from the coach battery through a series of interlocks. The interlocks ensure that the coach cannot be driven while the lift is in use. Further, the bus-side interlocks ensure the lift cannot be deployed without the transmission in neutral, the parking brake set, and the entrance doors open. Consult bus manufacturer for interlock sequence and features.

Hydraulic power necessary to operate the lift is provided by aviation fluid from an isolated reservoir that is pressurized by an electrically driven pump. The starter solenoid is only active when the following three conditions are met.

1. The power is switched on and the indicator light is illuminated.
2. A function is selected by the rotary switch.
3. The **"FUNCTION"** switch on the dash control is activated.



**PERSONS COULD BE INJURED BY THE LIFT PLATFORM WHEN IT IS BEING RAISED. LIFT OPERATORS MUST CHECK THAT PASSENGERS ARE CLEAR OF THE PINCH POINTS AT THE SIDES AND REAR OF THE LIFT PLATFORM BEFORE RAISING THE PLATFORM. DO NOT DEPEND ON THE SAFETY EDGES TO DETECT A PINCH POINT PROBLEM. LOOK AT EACH SIDE OF THE LIFT PLATFORM AND KEEP PASSENGERS CLEAR OF THE PINCH POINTS AS THE LIFT PLATFORM IS RAISED. PERSONS CAUGHT IN A PINCHING OR CRUSHING ACTION OF THE LIFT COULD BE SERIOUSLY INJURED.**



**PASSENGERS COULD BE PUSHED FROM THE PLATFORM BY ATTEMPTING TO STOW WHILE IT IS OCCUPIED. PASSENGERS COULD FALL FROM THE PLATFORM IF IT BEGINS TO STOW WHILE THEY ARE ABOARD. DO NOT ATTEMPT TO STOW THE LIFT WHEN PASSENGERS ARE ON THE LIFT PLATFORM. LOOK AT THE PLATFORM TO VERIFY THAT IT IS CLEAR BEFORE ATTEMPTING TO STOW. DO NOT DEPEND ON THE SENSITIVE MATS TO HALT OPERATION. STOP OPERATION IF ANYONE STEPS ONTO THE LIFT PLATFORM WHILE IT IS BEING STOWED AND DO NOT CONTINUE OPERATION UNTIL THE PLATFORM HAS BEEN CLEARED. PERSONS FALLING FROM THE LIFT COULD BE SERIOUSLY INJURED.**



### THEORY OF OPERATION

The **"DEPLOY"** function will cause the platform to extend from the bus toward the curb. When the operator selects **"LOWER"**, the lift will travel until it is resting on the ground, ready to load or off-load passengers. The **"RAISE"** function will cause the lift to travel until it is even with the coach floor. When **"STOW"** is activated, the lift will travel until it is fully retracted under the bus. The operations of both the inner and outer barriers are automatically controlled throughout the lift operation by the lift's electrical logic.

The LU10 platform lift uses a variety of sensors and switches to provide inputs to the controller. The lift will respond to the operator functions, i.e. **"DEPLOY"**, **"RAISE"**, **"LOWER"**, and **"STOW"**, only when the correct combination of sensors are active. For instance, the platform will respond to **"RAISE"** and **"LOWER"** only when the controller is receiving inputs that both barriers are formed and the lift is deployed. When the sensors are adjusted correctly, the controller will prevent the lift from damaging itself or operating in an unsafe manner.

The sensors and switches used on the LU10 can be divided into two categories – Positional and Interlocks

#### Positional Sensors and Switches

Six proximity sensors are used for determining various platform and barrier positions. The following list gives a brief description of the function of each proximity switch. Detailed instructions for adjusting the proximity sensors are included in section 5.

1. **Floor height sensor** – Indicates that the platform has reached vehicle floor level. When the floor height sensor activates the controller will cause the inner barrier to form the bridge
2. **Stow height sensor** – When this sensor switches from active to inactive, the platform has reached a level where it can be safely stowed.
3. **Step sensor** – This sensor is used to set the outer barrier angle. In addition, the step sensor must be active before the platform will stow.
4. **C/S Barrier sensor** – This sensor helps the controller distinguish between ramp and step positions of the outer barrier.
5. **Bridge sensor** – This sensor is active when the inner barrier is in the bridge position. The platform will not stow unless the bridge sensor is active.
6. **R/S Barrier sensor** – This sensor is active when the inner barrier is deployed. The platform cannot raise or lower unless the R/S Barrier sensor is active.

Two limit switches are used for determining various lift and platform positions. Detailed instructions for adjusting the limit switches are included in section 5. When adjusted properly, the limit switches perform the following functions:

1. **Stowed/Deployed limit switch** – This is a three position switch that tells the controller if the lift is stowed, deployed, or somewhere in between. The platform will not raise or lower unless the switch is in the deployed position. The bus-side interlocks will not release unless the switch is in the stowed position. If this limit switch is not in the stowed or deployed position a light on operator controls will illuminate (not available on all models - consult bus manufacture).



### THEORY OF OPERATION

2. **Chain limit switch** – When this switch is active the lift cylinders stop extending and the outer barrier forms a ramp. This switch is sometimes called the ground sensor.

#### Interlock Sensors and Switches

The interlocks prevent the lift from being operated in an unsafe manner. The sole purpose of the interlocks are for the safety of the passenger.

1. **Passenger sensor** – There are two sensitive mats on the platform surface designed to detect the weight of a person. If either one of these mats are activated the platform will not stow. A person could be pushed from the platform and seriously injured if the lift is stowed while occupied.
2. **Edges** – On the top surface of each edge guard is a switch known as a sensitive edge. This interlock will prevent an object or portions of a passenger's body from being pinched between the platform and the lifting arm. If the operator has the "**RAISE**" function activated and a sensitive edge becomes active, the platform will immediately begin to lower. The platform will continue lowering until the operator releases the "**FUNCTION**" switch. In order to continue operating the lift after an edge has been activated the operator must reset the controls. The controls may be reset by selecting "**LOWER**" and briefly activating "**FUNCTION**" switch. After the controls are reset, the platform will operate normally.
3. **Ramp interlock** – A passenger's wheelchair may become unsettled if the outer barrier begins to deploy before the passenger is completely on the platform. Affixed to the ramp surface of the outer barrier is an ultra-thin sensitive mat designed to detect the weight of a person. The outer barrier will not move from the ramp position if the ramp interlock is active.
4. **Bridge interlock** - A passenger's wheelchair may become unsettled if the inner barrier begins to deploy before the passenger is completely on the platform surface. The bridge interlock detects the weight of a person by the combination of a mechanical design feature and proximity switch. If the bridge interlock proximity switch becomes inactive, the inner barrier will not move from the bridge position.
5. **Threshold warning** – When the lift is deployed it is unsafe for anybody to enter or exit the vehicle. The threshold warning will sound an audible alarm and activate flashers if anybody comes within the threshold area (18 inches from the top step edge) while there is power to the lift and the platform is not at floor level. The threshold warning is activated by an ultra-thin switch affixed to the vehicle floor underneath the flooring material.

An interlock malfunction may prevent the operator from stowing the platform. A sensor override feature is provided to bypass the interlocks and allow the platform to be stowed. Both the operation of the sensitive edges and sensitive mats can be bypassed by this manner. Consult bus manufacturer for location of sensor override switch.

To perform a sensor override, activate sensor override switch, momentarily activate the "**LOWER**" function, and proceed with the desired function. The sensor override feature is to be used by those familiar with its operation, procedures, and consequences of such an action.



### THEORY OF OPERATION



PERSONS COULD BE PINCHED, CRUSHED, OR COULD FALL FROM THE LIFT PLATFORM IF THE PLATFORM IS OPERATED WITH THE SENSITIVE EDGE AND/OR MAT FEATURES DISABLED. DO NOT OPERATE THE LIFT IF THE SENSITIVE EDGE OR MAT FEATURES ARE NOT FUNCTIONING PROPERLY OR ARE OVERRIDDEN. DO NOT RELY ON THESE FEATURES TO DETECT PINCHING OR TO PREVENT STOWING WITH A PERSON ON THE PLATFORM. LOOK AT THE PLATFORM AND PASSENGER TO SEE THAT THEY ARE CLEAR OF MOVING PARTS AND IN NO DANGER. LOOK AT THE PLATFORM TO BE SURE THAT IT HAS BEEN CLEARED BEFORE STOWING IT. DO NOT OPERATE OR CONSIDER THE USE OF THE SENSOR OVERRIDE SWITCH AS A STANDARD OPERATING PROCEDURE. CONTACT MAINTENANCE PERSONNEL IMMEDIATELY IF SAFETY FEATURES ARE NOT OPERATING PROPERLY. PERSONS COULD BE SERIOUSLY INJURED IF THEY FALL FROM OR ARE PINCHED/CRUSHED BY THE LIFT PLATFORM.

When any lift function is selected, an electrical signal goes from the dash control to the control box assembly. An electrical circuit from the control box will begin the electrical signal that provides the hydraulic flow and pressure. The starter solenoid on the hydraulic power unit will then direct hydraulic flow and pressure to a four-bank directional control manifold where, depending on the lift function selected, and the orientation of the lift electrical logic, one or more of the directional control valve(s) may be shifted. The hydraulic pressure and flow then travel through the valve(s) to the hydraulic component(s), which will move the lift in the desired manner. The fluid is then returned to the hydraulic reservoir through the same components. Each of the directional control valves is a solenoid operated, three position, four-way valve with manual override features.

Valve #1 is the "stow/deploy" valve. When an electrical circuit is completed to solenoid "B" of valve #1, fluid flow and pressure is directed to port "B" of the hydraulic motor. This will cause the stow latch cylinder to extend, releasing the stow latch engagement with the power platform. The motor then rotates counter-clockwise (when observed from the shaft end), causing the lift to deploy. In a similar manner, a completed electrical circuit to solenoid "A" directs the fluid flow and pressure in the opposite direction causing the lift to stow.

Valve #2 is the "raise/lower" valve. When an electrical circuit is completed to solenoid "A" of valve #2, fluid flow and pressure is directed to the rod end of the lift cylinders, retracting both cylinders simultaneously and causing the lift platform to raise. Solenoid "B" of valve #2 pressurizes the cap end of the lift cylinders, causing them to extend simultaneously and allowing the lift platform to lower.

Valve #3 is the "ramp/barrier" valve. When an electrical circuit is completed to solenoid "B" of valve #3, fluid flow and pressure is directed to the cap end of the curbside barrier cylinder, extending the cylinder and causing the barrier to raise, forming a barrier from the stowed position, or forming a ramp from the barrier position. Solenoid "A" of valve #3 pressurizes the rod end of the cylinder, retracting the cylinder, causing the barrier to move from the ramp to the barrier or stowed positions.

Valve #4 is the "bridge/barrier" valve. When an electrical circuit is completed to solenoid "A" of valve #4, fluid and pressure is directed to the cap end of the roadside barrier cylinder, extending the cylinder and causing the barrier to raise from the bridge position to the barrier position. Solenoid "B" of valve #4 retracts the cylinder, operating the barrier from the barrier position to the bridge or stowed position.





### THEORY OF OPERATION

The lift hydraulic system employs six (6) pilot-operated check valves. These valves prohibit fluid flow in one direction unless pressure and flow are present from another direction. The hydraulic systems for the roadside barrier use double pilot-operated check valves. In this application, the function of the pilot operated check valve is to prevent fluid from both sides of the cylinder from returning to the reservoir unless solenoid "A" or "B" on valve #4 is energized electrically or manually. With fluid trapped in the roadside barrier cylinder by the pilot-operated check valves, the cylinder (and therefore the roadside barrier) cannot move. This prevents the barrier from a "bleed down" condition, as the cylinder is hydraulically bound. Therefore, the barrier remains firmly in position.

The curbside barrier cylinder is equipped with a relief valve on the "curbside barrier down" hydraulic circuit. This limits the maximum amount of pressure available to lower the curbside barrier. Consequently, this will prevent or limit the possibility of the barrier causing damage to the linkage or anything caught beneath the barrier while lowering to the ramp position.

Further, a second relief valve has been installed into the curbside barrier cylinder hydraulic circuit. This relief valve will release fluid pressure to the reservoir only if the hydraulic pressure is greater than the valve setting. This will preclude the possibility of damage if a heavy force is applied to the curbside barrier forcing the barrier from the barrier position to the ramp position. The hydraulic systems for the curbside barrier use single pilot-operated check valves. In this application, the function of the pilot operated check valve is to prevent fluid from both sides of the cylinder from returning to the reservoir unless solenoid "A" or "B" on valve #3 is energized electrically or manually. With fluid trapped in the curbside barrier cylinder by the pilot-operated check valves, the cylinder (and therefore the curbside barrier) cannot move. This prevents the barrier from a "bleed down" condition, as the cylinder is hydraulically bound. Therefore, the barrier remains firmly in position.

Each of the two main lift cylinders has a single pilot-operated check valve mounted directly to the rod end of the lift cylinders. With no solenoids energized on valve #2, the fluid in the rod end of the cylinder is trapped until solenoid "A" is energized. If solenoid "A" is energized, pressure and flow on the cap end of the cylinders is routed to the pilot port on the check valves, this will open the check valves and allow the fluid in the rod end of each cylinder to return to the reservoir (tank), causing the lift platform to lower.

The lift cylinders are equipped with cushion valves, which restrict the flow of fluid into or out of the cap end of the cylinders only when the cylinder is nearing the limit of their stroke. This slows the cylinder as the cylinder retracts, which in turn slows the lift platform as it reaches coach floor height. The cushion valve also affects the speed of the lift cylinder during the first part of the cylinder's extension. By adjusting the cushion valve, the lift platform will lower (or raise) smoothly from (to) coach floor level.

The lift is equipped with a double acting hand pump which, when used in conjunction with the manual override feature on the directional control valves, is capable of performing every hydraulic function of the lift. By manually pushing the extended pin on the end of the appropriate directional control valve and pumping the hand pump, the operator can raise or lower the lift, operate both roadside and curbside barriers, as well as stow or deploy the lift. A decal notes and provides a quick reference for the manual operation procedures. Consult bus manufacturer for location of manual operation decal.



### THEORY OF OPERATION



**DURING MANUAL OPERATION, THE LIFT MECHANISM WILL MOVE TO THE EXTREMES OF THE HYDRAULIC AND MECHANICAL LIMITS. ALL NORMAL SAFETY FEATURES AND LIMIT SWITCHES ARE BYPASSED. THE LIFT WILL NOT AUTOMATICALLY POSITION ITSELF, NOR WILL THE LIFT STOP WHEN A PASSENGER OR OBJECT CONTACTS THE PRESSURE SENSITIVE EDGES OR MATS. BEFORE MANUAL LIFT OPERATION, BE SURE THAT ALL UNAUTHORIZED PASSENGERS ARE WELL AWAY FROM THE LIFT AREA. OBSERVE THE LIFT AND PASSENGER ON THE PLATFORM DURING OPERATION TO BE SURE THAT ALL PASSENGERS ARE CLEAR OF PINCH AND CRUSH POINTS ON THE LIFT PLATFORM. USE EXTREME CAUTION WHEN MANUALLY OPERATING THE LIFT AND FOLLOW PROCEDURES CAREFULLY. FAILURE TO OBSERVE THE LIFT AND PASSENGER DURING MANUAL OPERATION COULD RESULT IN SERIOUS INJURY. THE LIFT COULD BE DAMAGED IF CORRECT PROCEDURES ARE NOT FOLLOWED.**

When the lift platform is being raised, force from the lift cylinders pull the lift chains which cause the inner hubs to rotate. The inner hubs are part of the master arm weldment that includes a inner hub, outer hub, torque shaft, and lift arm. The master arm weldments are attached to each other by a keyed coupling that fits over the torque shafts and keeps the master arms synchronized. Each outer hub keeps the lift slave arms synchronized to the lift master arms by a slave chain. Together, the master/slave arm assemblies produce a parallelogram that maintains an even, horizontal plane to the lift platform as it raises or lowers.

The stow/deploy mechanism, powered by the hydraulic motor, also utilizes chains. The primary stow/deploy chain is attached directly to the drive motor and to a sprocket on the drive shaft. The drive shaft, which extends nearly the entire width of the lift, terminates in each slide channel, where another sprocket is attached to each end. Inside each of the slide channels the stow/deploy secondary chains attach to the drive sprockets, loop over an idler sprocket and terminate at a fixed point at the curbside and roadside ends of the slide channels. When the stow/deploy motor turns, the drive shaft is rotated by the stow/deploy primary chain; the lift is pulled along the channels by the drive sprockets rotating in the stow/deploy secondary chains.

The entire lift mechanism stows, deploys and is supported on four nyatron bearing blocks that ride within the confines of the slide channels.

The lift is equipped with a hydraulically released mechanical latch, which prevents the lift from drifting out once the platform is fully stowed. The latch is released (allowing the platform to deploy) whenever the "B" port of the motor is pressurized to deploy the lift. A tee in the "B" port line goes to a small single-acting hydraulic cylinder that extends to release the latch mechanism when the lift begins to deploy.

The bridge interlock works on the principle that the inner barrier cylinder will move in a direction of least resistance. For instance, if one were to hold the cylinder body stationary and energize the cylinder, the rod would move. On the other hand, if one were to hold the cylinder rod stationary and energize the cylinder, the body would move. This principle is exploited in the bridge interlock design.

The clevis of the inner barrier cylinder is supported horizontally by a gas spring. Under normal operation this support is sufficient to hold the cylinder body stationary as the rod is extended. The extension of the rod moves the inner barrier from bridge to barrier position. However, when a passenger occupies the bridge and the cylinder becomes energized, the support provided by the gas spring is not sufficient. In this case, the rod is being held stationary and the cylinder body moves against the gas spring. The bridge interlock sensor becomes inactive when this movement is detected.





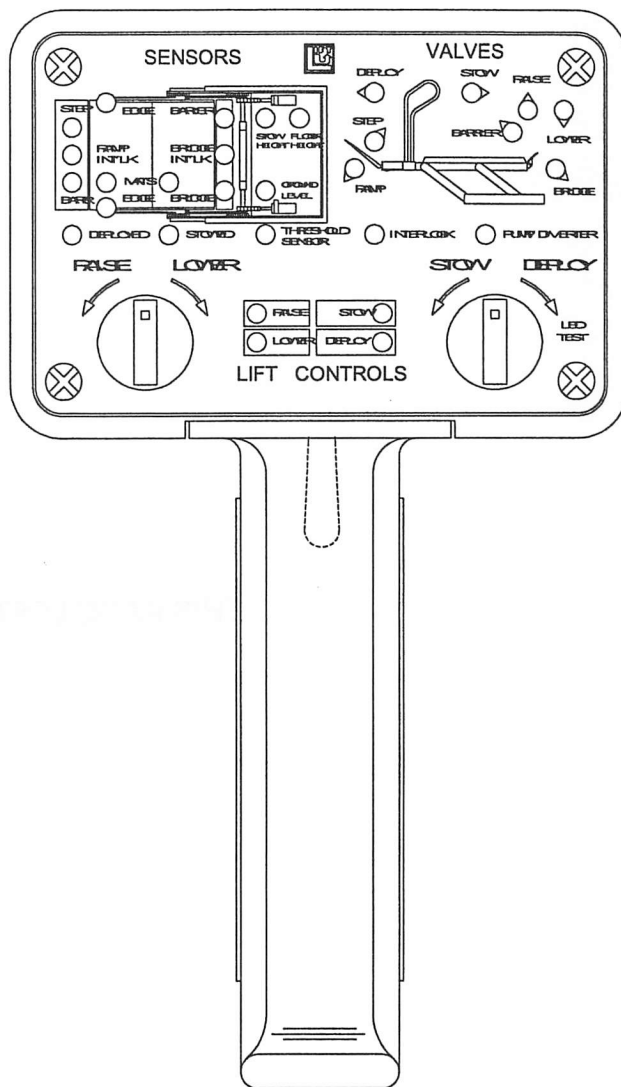
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## Section 1 GENERAL INFORMATION

### OPTIONAL EQUIPMENT (HAND-HELD MAINTENANCE CONTROLLER)

The lifts electrical circuitry has a feature that allows the lift to be operated from a Hand Held Maintenance Controller (Optional equipment).

The Hand-Held Maintenance Controller is an aid that allows the **LIFT-U®** lift to be operated from a distance that is equal to the length of the power cables. The Maintenance Controller is equipped with switches that operate all lift functions. The Maintenance Controller is also equipped with Light Emitting Diodes (LED's) in the face plate which aid in the troubleshooting of the bus dash switches and the lifts valves and sensors. The Maintenance Controller can be used during maintenance and road calls instead of the bus dash controls. The bus-side interlock and safety features must be intact and properly actuated, and there must be switched, fused, DC voltage from the 14-Pin bus-side connector to the lift's Electrical Control Box. The power cable of the Maintenance Controller inserts into the unoccupied outlet in the bottom of the lift's Electrical Control Box. The same Maintenance Controller is used on both the 12 Volt and 24 Volt lifts.





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# Section 1

## GENERAL INFORMATION

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# **Operator Instructions**



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## Section 2

# OPERATOR INSTRUCTIONS

### OPERATOR SAFETY NOTICES

The following information is intended to apply to a variety of lift controls supplied by various coach manufacturers.

The operator should strictly adhere to the warnings and procedures and should not attempt to operate the lift without clear understanding of the procedures.

Personnel must read and understand the warnings and cautions contained in this manual before operating the lift. If you do not understand the warning notice or the signal word and its instructions, seek further explanation from training personnel, the bus manufacturer or the **LIFT-U®** representative.

Only after receiving training as to proper lift operation should personnel operate the lift.



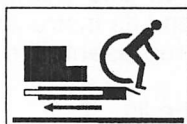
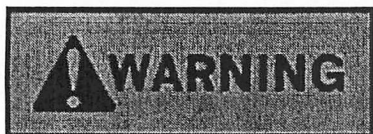
LIFT PASSENGERS MAY NOT BE ABLE TO REACT TO A HAZARDOUS SITUATION DURING LIFT OPERATIONS. THE LIFT OPERATOR MUST OBSERVE ALL LIFT PASSENGERS DURING THE ENTRY, OPERATION, AND EXIT OF THE WHEELCHAIR LIFT. THE LIFT OPERATOR MUST ALSO INSTRUCT THE PASSENGER AS TO THE PROPER USE OF THE LIFT. HALT LIFT OPERATIONS IF A HAZARDOUS SITUATION DEVELOPS. THOSE SITUATIONS COULD INCLUDE (BUT ARE NOT LIMITED TO) FAILURE TO LOCK WHEELS, INCORRECT PASSENGER POSITIONING ON THE LIFT PLATFORM, ENTANGLEMENT IN THE LIFT MECHANISM, OR LOSS OF BALANCE.



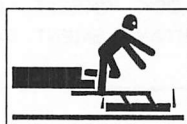
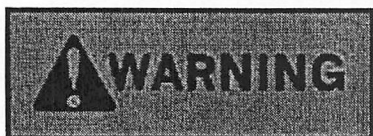
LOOK TO VERIFY THAT THE COACH IS IN AN APPROPRIATE AREA BEFORE OPERATING THE LIFT. SELECT A FLAT, OPEN, ACCESSIBLE AREA TO DEPLOY THE LIFT. BE SURE THAT THE LIFT WILL LOWER FLUSH TO THE STREET/SIDEWALK SURFACE AND WITHOUT OBSTRUCTION BEFORE ALLOWING PASSENGERS ONTO THE LIFT. IF THE LIFT ENCOUNTERS AN OBSTRUCTION WHEN LOWERING TO PICK UP A PASSENGER, STOP OPERATION, HAVE THE PASSENGER MOVE CLEAR OF THE LIFT LANDING AREA, STOW THE LIFT, AND REPOSITION THE COACH. IF THE LIFT ENCOUNTERS AN OBSTRUCTION WHEN LOWERING, TO ALLOW A PASSENGER TO EXIT THE COACH, STOP OPERATION, RETURN THE LIFT TO COACH FLOOR LEVEL, HAVE THE PASSENGER RETURN TO THE SEATING AREA, STOW THE LIFT, AND REPOSITION THE BUS.



### OPERATOR SAFETY NOTICES



LIFT PASSENGERS COULD BE PUSHED FROM THE PLATFORM BY THE OPERATOR ATTEMPTING TO STOW THE LIFT PLATFORM WHILE THE PLATFORM IS OCCUPIED. DO NOT ATTEMPT TO STOW THE LIFT PLATFORM WHEN PASSENGERS ARE ON IT. LOOK AT THE LIFT PLATFORM TO VERIFY THAT IT IS CLEAR BEFORE ATTEMPTING THE STOW FUNCTION. DO NOT DEPEND ON THE PRESSURE SENSITIVE MAT TO HALT OPERATION IF THE LIFT PLATFORM IS OCCUPIED. STOP OPERATION IF ANYONE ENTERS THE LIFT PLATFORM WHILE IT IS BEING STOWED.



LIFT PASSENGERS ATTEMPTING TO ENTER THE LIFT PLATFORM WHEN IT IS NOT AT GROUND LEVEL OR AT COACH FLOOR LEVEL, COULD LOSE THEIR BALANCE, SLIP OR TRIP, OR BECOME ENTANGLED IN THE LIFT MECHANISM. PASSENGERS MAY BE ALLOWED TO ENTER THE LIFT ONLY WHEN IT IS AT GROUND LEVEL OR AT COACH FLOOR LEVEL WITH THE BARRIERS IN THE PROPER POSITIONS TO ALLOW ACCESS. PASSENGERS MAY NOT ENTER THE LIFT AT ANY OTHER TIME WHILE THE LIFT IS IN USE. WHEN PROHIBITED ENTRY IS ATTEMPTED, LIFT OPERATION MUST BE STOPPED AND THE PASSENGER REMOVED. PASSENGERS COULD BE SERIOUSLY INJURED IF THEY ATTEMPT TO BOARD THE LIFT PLATFORM WHEN IT IS MOVING OR WHEN THE BARRIERS ARE IN THE IMPROPER POSITIONS.



USING THE LIFT WITH EITHER OF THE BARRIERS IN ANYTHING BUT THE BARRIER POSITIONS COULD ALLOW THE PASSENGER TO FALL FROM THE LIFT. ALWAYS VERIFY THAT THE BARRIERS ARE IN THE CORRECT POSITIONS PRIOR TO LOADING AND LIFTING PASSENGERS. THE CURBSIDE BARRIER SHOULD BE IN THE BARRIER POSITION AT ALL TIMES EXCEPT WHEN LIFT PLATFORM RESTS AT GROUND LEVEL. THE ROADSIDE BARRIER SHOULD BE IN THE BARRIER POSITION AT ALL TIMES EXCEPT WHEN THE LIFT PLATFORM IS AT COACH FLOOR LEVEL.

### TO SAFELY OPERATE THE LIFT

LIFT-U® lifts installed at the front door of the coach have operator controls that allow the lift to be operated without the operator leaving his/her seat. The control panel is typically located on the right side of the coach dash panel. Lifts installed at the rear door of the coach have operator controls inside a locked pedestal near the rear door. Operator controls, operational sequence, and interlocks are designed by the bus manufacturer. However, the procedures remain similar for all LIFT-U® platform lifts regardless of vehicle manufacturer. For further information on lift operator controls, interlock, and override information consult bus manufacturer. The enclosed information applies to the typical bus-side lift operational procedures.



## OPERATOR CONTROLS

### POWER SWITCH

The **"POWER"** switch enables and disables the lift controls. Whenever the lift controls are enabled, an indicator light will illuminate. Before the **"POWER"** switch can enable the lift controls, certain bus-side interlocks must be set. The transmission must be in park or the transmission must be in neutral and the parking brake set. Furthermore, the transmission may not be taken out of park nor can the parking brake be released unless the **"POWER"** switch is off. These are minimum interlock requirements set by FMVSS 49 CFR 571.403. Some vehicle manufacturers may require the doors, for instance, to be open before the lift controls can be enabled. Consult the bus manufacturer to identify other bus-side interlocks that need to be set before the lift controls can be enabled. The vehicle manufacturer may also preclude and/or energize other bus-side circuits as a result of activating the lift's **"POWER"** switch.

### CONTROL SWITCHES

The lift controls are comprised of two switches, a multiple position selector switch and a momentary switch. The selector switch has a position labeled for each function: **"DEPLOY"**, **"RAISE"**, **"LOWER"**, and **"STOW"**. The momentary switch will be labeled **"FUNCTION"** or **"OPERATE"**.

#### Deploying the lift

The **"DEPLOY"** function causes the lift to move curbside until it reaches its limit of travel. To deploy the lift move the selector switch to **"DEPLOY"**, and activate the momentary **"FUNCTION"** switch. Provided the lift controls are enabled by the **"POWER"** switch, the platform will extend curbside. Maintain pressure on the momentary switch until lift reaches its limit of travel. The lift at this position is referred to as **"fully deployed"**. The lift will remain in motion as long as the **"FUNCTION"** switch is held or the lift reaches its deployed limit. Releasing the **"FUNCTION"** switch will halt all lift motion.

#### Raising the platform

The **"RAISE"** function causes the platform to travel toward the vehicle floor. To raise the platform, move the selector switch to **"RAISE"** and activate the momentary **"FUNCTION"** switch. Provided the lift is fully deployed, the platform will begin to rise. When the platform reaches its vertical limit the inner barrier will form the bridge. The lift at this position is referred to as **"floor loading position"**. During **"RAISE"**, the lift will remain in motion as long as the **"FUNCTION"** switch is held or the platform reaches floor loading position. Releasing the **"FUNCTION"** switch at any time will halt all lift motion.

The control logic will not allow the platform to rise unless both barriers are deployed. If either barrier is not deployed, the **"RAISE"** function will deploy the barriers before any movement of the platform occurs.

#### Lowering the platform

The **"LOWER"** function causes the platform to travel toward the ground. To lower the platform, move the selector switch to **"LOWER"** and activate the momentary **"FUNCTION"** switch. Provided the lift is fully deployed, the platform will begin to lower. When the controller senses the platform has reached ground the outer barrier will form the ramp. The lift at this position is referred to as **"ground loading position"**. During **"LOWER"**, the lift will remain in motion as long as the **"FUNCTION"** switch





## Section 2

# OPERATOR INSTRUCTIONS

is held or the platform reaches ground loading position. Releasing the **"FUNCTION"** switch at any time will halt all lift motion.

The control logic will not allow the platform to lower unless both barriers are deployed. If either barrier is not deployed, the **"LOWER"** function will deploy the barriers before any movement of the platform occurs.

### Stowing the lift

The **"STOW"** function causes the lift to move to a position suitable for normal vehicle travel. To stow the lift, move the selector switch to **"STOW"** and activate the momentary **"FUNCTION"** switch. The lift controller will position the platform at the proper height, move the barriers into their stowed positions, and retract the lift. The **"STOW"** function can be activated from any platform position. During **"STOW"**, the lift will remain in motion as long as the **"FUNCTION"** switch is held or the lift reaches stowed position. Releasing the **"FUNCTION"** switch at any time will halt all lift motion.

### Optional control features

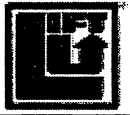
**Sensor override switch** – This switch can be activated if the lift fails to stow due to a sensitive mat or sensitive edge failure. In most cases, the override switch is under a red guarded cover and located a distance from operator control panel. Consult the bus manufacturer for the location of the sensor override switch.

**"OFF" function** – Some bus manufacturers will include an **"OFF"** position for the selector switch. Return the selector switch to this position when the lift is stowed and not in use.

**"NO STEP" light** – This light will illuminate when the lift is in use and the bus side interlock features are activated. The **"NO STEP"** light will serve to remind operators that the lift is in use and normal entry and exit of the vehicle is restricted.



OPERATION OF THE LIFT WITH THE PASSENGER SENSOR OVERRIDE SWITCH ACTIVATED PREVENTS DETECTION OF PINCH POINTS THAT COULD DEVELOP AT THE SIDES OF THE PLATFORM WHEN IT IS BEING RAISED. IN A SIMILAR CASE, THE LIFT PLATFORM WILL INITIATE A STOW MODE WITH PASSENGERS OR OBJECTS ON THE LIFT PLATFORM. THIS COULD ALLOW PASSENGER INJURY. DO NOT USE THIS SWITCH WHEN PASSENGERS ARE ON THE PLATFORM. AT ALL TIMES, OBSERVE PASSENGERS ON THE LIFT PLATFORM TO DETECT POTENTIAL HAZARDOUS SITUATIONS. FAILURE TO DO SO COULD RESULT IN THE SERIOUS INJURY OF A PASSENGER OR DAMAGE TO THE LIFT.



### SAFETY FEATURES

The lift is equipped with sensors designed to help prevent unsafe operation of the lift. While these sensors may reduce the possibility of an incident, the lift operator must always monitor the lift, its passenger, and others who are nearby. Safe operation of the platform lift is the responsibility of the operator.

#### Sensitive edges

As the platform is raised from ground level, the lift arms and strong arms pass in close proximity to the edge guards on the platform. It is possible for a passenger, or someone on the ground, to be pinched between the edge guards and the lift arms or strong arms. On the top surface of each edge guard is a pressure sensitive strip often referred to as a "sensitive edge". During the "RAISE" operation, pressure applied to these strips will immediately cause the lift to lower. The lift will continue to lower until it reaches the ground or the operator releases the "FUNCTION" switch. To resume the "RAISE" function, the operator must clear the obstruction from the sensitive edge and reset the controller. The controller may be reset by activating the "LOWER" function. The platform will not respond to any operator function until the controller is reset.

It may be possible for the sensitive edges to remain in the "active" state even with all obstructions removed. If the platform still fails to respond to the "RAISE" function and it is unoccupied, engage the sensor override switch. The sensor override switch will allow the lift to be stowed with an "active" sensitive edge. Replace the failed sensitive edge before returning the lift to service.

#### Stow interlock

Stowing the lift while the platform is occupied could cause serious injury to a passenger. As precaution, the platform surface is equipped with a sensitive mat that is able to detect the presence of a passenger. If the "STOW" function is selected and the platform is occupied the platform will not move.

If the lift fails to respond to the "STOW" function, verify the platform is clear of all objects. With the platform unoccupied, engage the sensor override switch. The sensor override switch will allow the lift to be stowed with an "active" sensitive mat. Replace the failed sensitive mat before returning the lift to service.

#### Outer barrier interlock

At ground loading position, the outer barrier forms a ramp providing a transition from the ground to the platform surface. When "RAISE" is activated, the ramp deploys to form the outer barrier. A person could become unsettled if they or their mobility aid occupies the ramp as it deploys. As a precaution, the ramp surface is equipped with a sensitive mat that is able to detect the presence of a passenger. The outer barrier will not deploy from the ramp position if the sensitive mat is "active"

#### Inner barrier interlock

At floor loading position, the inner barrier forms a bridge providing a transition from the vehicle floor to the platform surface. When "LOWER" is activated, the bridge deploys to form the inner barrier. A person could become unsettled if they or their mobility aid occupies the bridge as it deploys. As a precaution, the inner barrier mechanism includes a sensor that can detect the presence of a passenger. The inner barrier will not deploy if this sensor is "active".



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## Section 2

# OPERATOR INSTRUCTIONS

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### Threshold warning signal

The platform lift is an integral part of the vehicle step well. When the lift is deployed, the first step is not present. This condition presents a hazard to passengers on the bus. Whenever the following conditions are present, a visual and audible warning signal will activate.

1. The **"POWER"** switch has enabled the operator controls.
2. The platform is not at floor loading position.
3. A passenger comes into the threshold area. The threshold area is a 36 x 18 inch rectangle on the vehicle floor adjacent to the top step.

This is only a warning signal. It does not prevent the operation of any of the lift functions. If a passenger activates the threshold warning, instruct them to move out of the threshold area until the platform is safe to board.



## OPERATOR CONTROLS

### WHEELCHAIR PASSENGER

1. Persons or objects should be clear of the lift while it is being operated.
2. Bring the coach to a complete stop in an approved lift-loading zone. A lift-loading zone shall be a flat area one to three feet from the curb. The lift should be deployed onto a level, debris-free, and unobstructed area.
3. Place the coach transmission into neutral and set the parking brake.
4. Open the vehicle door.
5. Instruct all passengers to stand clear, and activate the lift power switch.
6. Use the operator controls to deploy the lift.
7. Use the **"RAISE"** or **"LOWER"** function to bring the platform to the level of the mobility impaired passenger.
8. Instruct the passenger to enter the lift platform.
9. Instruct the passenger to lock the wheels and grasp the handrails.
10. Observe the passenger to be sure that they are clear of all moving parts and potential pinch points.
11. Operate the lift and observe the passenger as the transfer is made to the ground level or to the coach floor level.
12. Observe the passenger exiting the platform.
13. Instruct persons to stand clear.
14. Stow the lift platform. Watch the stow operation to be sure that no one attempts to enter or exit the bus over the lift platform as it stows. Verify that the lift platform is in the stowed position.
15. Deactivate the lift power switch.



## OPERATOR CONTROLS

### STANDEE PASSENGER

1. Persons or objects should be clear of the lift when it is being operated.
2. Bring the coach to a complete stop in an approved lift-loading zone. A lift-loading zone shall be a flat area one to three feet from the curb. The lift should be deployed onto a level, debris-free, and unobstructed area.
3. Place the coach transmission into neutral and set the parking brake.
4. Open the vehicle door.
5. Instruct all passengers to stand clear, and activate the lift power switch.
6. Use the operator controls to deploy the lift.
7. Use the **"RAISE"** or **"LOWER"** function to bring the platform to the level of the mobility impaired passenger.
8. Instruct the passenger to stand within the yellow box and grasp the handrails.
9. Warn the passenger of low overhead clearance.
10. Observe the passenger to be sure they are clear of all moving parts and potential pinch points.
11. Activate the lift and observe the passenger as the transfer is made to the ground or coach floor level.
12. Observe the passengers as they leave the platform.
13. Instruct persons to stand clear.
14. Stow the lift. Watch the stow operation to be sure that no one attempts to enter or exit the lift platform as it stows. Verify the lift is in the stowed position.
15. Deactivate the lift power switch.



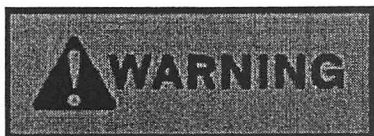
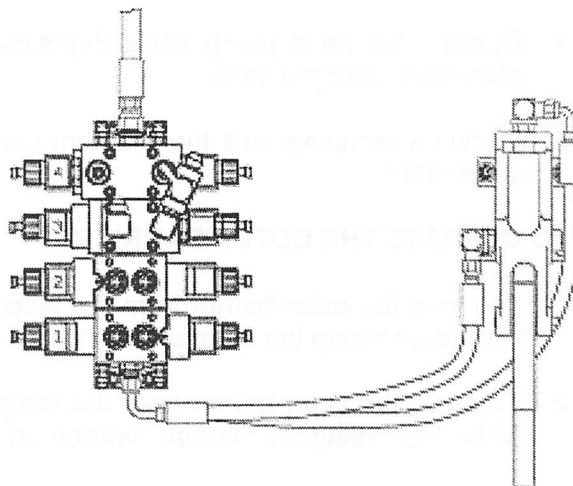
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## Section 3

# MANUAL OPERATING PROCEDURES

### GENERAL MANUAL OPERATING PROCEDURES

If the lift cannot be operated electrically, a hand pump can be used to operate the lift manually. To operate the lift manually, the operator must use the hand pump to produce hydraulic flow and pressure. The hydraulic flow and pressure will then need to be directed to the desired function by the operation of the manual overrides on the directional control valves. The hand pump, handle, and directional control valves are located on the power/control assembly. The power/control assembly is typically located behind the curbside front wheel. If not, consult bus manufacturer for location of the power/control assembly. It is recommended that manual operation be used as a temporary measure for offloading passengers only.



**WARNING**

**DURING MANUAL OPERATION, THE LIFT MECHANISM COULD MOVE TO THE EXTREMES OF THE HYDRAULIC AND MECHANICAL LIMITS. ALL NORMAL SAFETY FEATURES AND LIMIT SWITCHES ARE BYPASSED. THE LIFT WILL NOT AUTOMATICALLY POSITION ITSELF, NOR WILL THE LIFT STOP WHEN A PASSENGER OR OBJECT CONTACTS THE PRESSURE SENSITIVE EDGES OR MATS. BEFORE MANUAL LIFT OPERATION, BE SURE THAT ALL UNAUTHORIZED PASSENGERS ARE WELL AWAY FROM THE LIFT AREA. OBSERVE THE LIFT AND PASSENGER ON THE PLATFORM DURING OPERATION TO BE SURE THAT ALL PASSENGERS ARE CLEAR OF PINCH AND CRUSH POINTS ON THE LIFT PLATFORM. USE EXTREME CAUTION WHEN MANUALLY OPERATING THE LIFT AND FOLLOW PROCEDURES CAREFULLY. FAILURE TO OBSERVE THE LIFT AND PASSENGER DURING MANUAL OPERATION COULD RESULT IN SERIOUS INJURY. THE LIFT COULD BE DAMAGED IF CORRECT PROCEDURES ARE NOT FOLLOWED.**



**CAUTION**

#### **FOR MANUAL OPERATION OF THE LIFT, THE OPERATOR MUST:**

1. **BRING THE COACH TO A COMPLETE STOP IN AN APPROVED LIFT-LOADING ZONE. A LIFT-LOADING ZONE SHALL BE A FLAT AREA ONE TO THREE FEET FROM THE CURB. THE LIFT SHOULD BE DEPLOYED ONTO A LEVEL, DEBRIS FREE, AND UNOBSTRUCTED AREA.**
2. **PLACE THE COACH IN NEUTRAL. ACTIVATE PARKING BRAKE.**
3. **OPEN THE ENTRANCE DOOR TO THE FULL OPEN POSITION.**
4. **CAUTION PASSENGERS TO STAND CLEAR WHILE THE LIFT IS IN USE.**
5. **NOT EXCEED SEVENTY-FIVE (75) POUNDS OF FORCE AGAINST THE HAND PUMP HANDLE.**





### TO DEPLOY THE LIFT

1. Operate the hand pump while depressing the manual override on valve **"1B"**. This extends the platform toward the curb.
2. Continue pumping until the platform cannot extend any further. Release the manual override on valve **"1B"**.

### TO OPERATE THE OUTER BARRIER

1. To move the outer barrier from the step position toward the ramp position, operate the hand pump while depressing the manual override on valve **"3B"**.
2. To move the outer barrier from the ramp position toward the step position, operate the hand pump while depressing the manual override on valve **"3A"**.
3. If a deployed position is desired, release the manual override and discontinue pumping when the outer barrier reaches an angle of 90 degrees from the platform surface.

### TO OPERATE THE INNER BARRIER



THE ROADSIDE BARRIER DOES NOT HAVE SUFFICIENT CLEARANCE TO OPERATE UNTIL THE LIFT MECHANISM IS FULLY DEPLOYED. FULLY DEPLOY THE LIFT MECHANISM BEFORE ATTEMPTING TO OPERATE THE ROADSIDE BARRIER. THE ROADSIDE BARRIER OR THE COACH MAY BE DAMAGED IF THE ROADSIDE BARRIER IS OPERATED PREMATURELY.

1. To move the inner barrier from the bridge position to the deployed position, operate the hand pump while depressing the manual override on valve **"4A"**. Continue pumping until the inner barrier cannot move any further.
2. To move the inner barrier from the deployed position to the bridge position, operate the hand pump while depressing the manual override on valve **"4B"**. Continue pumping until the inner barrier cannot move any further.



### TO RAISE OR LOWER THE PLATFORM



THE LIFT COULD BE DAMAGED IF THE PLATFORM IS RAISED OR LOWERED BEFORE THE LIFT MECHANISM IS FULLY DEPLOYED. LIFT PASSENGERS COULD ROLL OFF THE PLATFORM IF BOTH BARRIERS ARE NOT RAISED PRIOR TO RAISING OR LOWERING THE LIFT PLATFORM. DO NOT USE THE LIFT TO TRANSFER PASSENGERS IF THE BARRIERS CANNOT BE PROPERLY POSITIONED.

1. To raise the platform, operate the hand pump while depressing the manual override on valve "2A". Continue pumping until the platform reaches the desired level. Release the manual override on valve "2A".
2. To lower the platform, operate the hand pump while depressing the manual override on valve "2B". Continue pumping until the platform reaches the desired level. Release the manual override on valve "2B".

Each lift cylinder is equipped with a pilot operated check valve. This requires both pressure and flow to be present before the cylinder will extend (lower the platform). When lowering the lift manually, there is not enough flow to hold both check valves open at the same time. Therefore, the platform may not lower initially because only one cylinder can extend at a time.

**NOTE:** The lift platform may be raised or lowered as many times as necessary to unload passengers without stowing the lift between each cycle.

### TO STOW THE LIFT



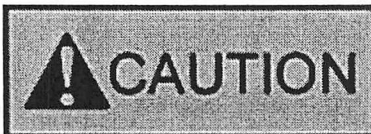
PERSONS OR OBJECTS ON THE LIFT PLATFORM COULD BE PUSHED OFF DURING STOW OPERATION. DURING MANUAL OPERATION, THE SENSITIVE MAT ON THE PLATFORM WILL NOT HALT THE STOW MODE IF PERSONS OR OBJECTS ARE ON THE LIFT PLATFORM. DO NOT ATTEMPT TO STOW THE LIFT MECHANISM WHILE ANYTHING (PASSENGER OR OTHERWISE) ARE ON THE LIFT PLATFORM. THE LIFT PLATFORM MUST BE CLEARED BEFORE STOWING THE LIFT MECHANISM. PERSONS SHOULD BE WARNED TO STAY CLEAR OF THE LIFT DURING THE STOW OPERATION. PERSONS ON THE LIFT DURING STOW OPERATION COULD BE SERIOUSLY INJURED IF THEY FALL OR ARE PUSHED OFF THE PLATFORM.



## Section 3

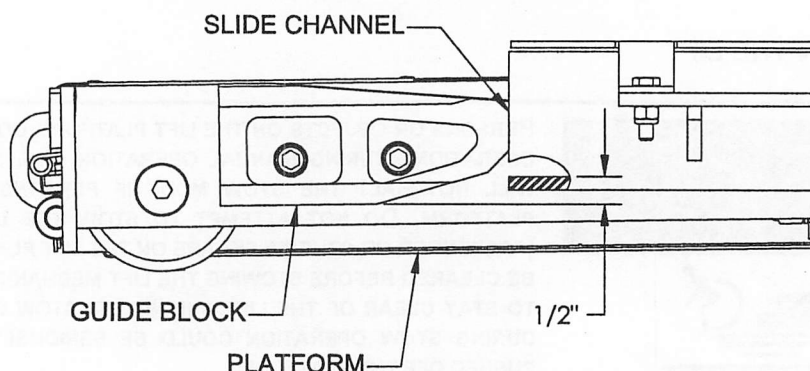
# MANUAL OPERATING PROCEDURES

1. Clear the platform of all persons and objects.
2. Warn all persons to stay clear of the lift area.
3. Place the outer barrier in the step position (valve "3A").
4. Place the inner barrier in the bridge position (valve "4B").
5. Bring the platform to stow height. Raise (valve "2A") or lower (valve "2B") the platform as required.



THE LIFT MECHANISM MAY BE DAMAGED IF THE LIFT PLATFORM HEIGHT IS NOT CORRECTLY ALIGNED FOR THE STOW OPERATION. AT INITIAL STOW HEIGHT LEVEL; CONFIRM THE ALIGNMENT OF THE GUIDE BLOCKS ON THE LIFT PLATFORM WITH THE SLIDE CHANNELS. THE GUIDE BLOCKS SHOULD BE ALIGNED SUCH THAT THEY WILL ENTER THE SLIDE CHANNELS. IF THEY ARE NOT ALIGNED, RAISE OR LOWER THE LIFT PLATFORM UNTIL THE PROPER STOW HEIGHT ALIGNMENT IS ACHIEVED. ONCE THE GUIDE BLOCKS AND SLIDE CHANNELS ARE ALIGNED, PROCEED WITH STOW OPERATIONS. FAILURE TO ALIGN THE PLATFORM HEIGHT DURING STOW OPERATIONS MAY DAMAGE THE LIFT MECHANISM.

6. When the platform reaches stow height, retract the platform by operating the hand pump while depressing the manual override on valve "1A".
7. When the platform is 12-18 inches from the stowed position, re-confirm the guide block alignment. See diagram below for proper guide block alignment. Re-align as required.



8. Continue pumping until the platform cannot retract any further. The curbside portion of the platform should be flush with the end of the slide channels.

# **Maintenance**



### GENERAL MAINTENANCE

Maintenance of the **LIFT-U®** lift consists of cycling, cleaning, inspection, adjustment, and lubrication. Cycling is part of the maintenance routine because many issues can be avoided by operating the lift through one cycle everyday. Except for cycling, no special maintenance interval is required if the coach follows a routine maintenance schedule. **However, the maximum interval under normal conditions is 6 weeks or 500 cycles.** Abnormal conditions, such as extreme weather, sand, salt, snow, and temperature fluctuations, require intervals less than normal conditions. **The maximum maintenance interval under abnormal conditions is not to exceed 30 days or 360 cycles.** The procedures and intervals described herein are not intended to be all-inclusive. The procedures and maintenance intervals described herein are intended to cover the foreseeable service contingencies to the best of our abilities. However, if a service condition is encountered that is not covered in this manual, obtain advice from the coach manufacturer or from a **LIFT-U®** representative to clarify or obtain servicing instructions. This manual also assumes that maintenance personnel are familiar with OSHA safety practices and that management enforces those practices.



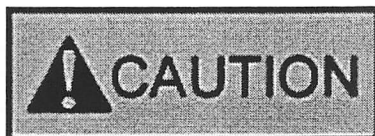
**WARNING**

OPERATION OF THE LIFT WHEN THE PRESSURE SENSITIVE EDGES, SENSITIVE MATS, ROADSIDE/CURBSIDE BARRIERS, PROXIMITY SENSORS, AND/OR LIMIT SWITCHES ARE DAMAGED, MIS-ADJUSTED, OR NOT FUNCTIONAL COULD RESULT IN LIFT DAMAGE AND INJURY TO PERSONNEL OR PASSENGERS. DO NOT OPERATE THE LIFT WHEN ANY OF ITS COMPONENTS ARE DAMAGED, MALADJUSTED, OR NOT FUNCTIONAL. REPAIR THE LIFT MECHANISM BEFORE RETURNING THE COACH TO LIFT SERVICE. OPERATION OF THE LIFT MECHANISM WHEN IT IS DAMAGED, MIS-ADJUSTED, OR PARTIALLY NON-FUNCTIONAL COULD RESULT IN SERIOUS INJURY TO PERSONNEL, PASSENGERS AND/OR LIFT/COACH DAMAGE.

#### Cycling

Operate the lift through one complete cycle everyday. Using the operator controls **"DEPLOY"**, **"RAISE"**, **"LOWER"**, and **"STOW"** the lift.

#### Cleaning



**CAUTION**

THE ELECTRICAL CONTROL BOXES, LIMIT SWITCHES, PROXIMITY SENSORS, CABLE CONNECTIONS, JUNCTION BOXES, SLAVE CHAINS, AND LIFT CHAINS MAY BE DAMAGED BY WATER FORCED INTO THESE COMPONENTS DURING PRESSURE WASHING. AVOID DIRECT PRESSURE WASHING OF THE ELECTRICAL CONTROL BOXES, LIMIT SWITCHES, PROXIMITY SENSORS, CABLE CONNECTIONS, JUNCTION BOXES, SLAVE CHAINS, AND LIFT CHAINS. DO NOT POINT THE PRESSURIZED SPRAY DIRECTLY AT THESE COMPONENTS. ONCE WATER IS FORCED INTO THESE COMPONENTS, THEY MAY BE DAMAGED BY CORROSION OR ALLOW ELECTRICAL SHORT-CIRCUITING. THIS DAMAGE MAY CAUSE LIFT MALFUNCTIONS AND PASSENGER INJURY.





### Cleaning Continued...

To obtain maximum performance and reliability and to aid passenger safety, some lift components need to be cleaned during the maintenance procedure. After deploying the lift, clean the following components:

1. Lift platform surface.
  - a. Rinse with water. (Do not rinse with high pressure).
  - b. Clean with mild soap as required.
  - c. Blow excess water off with air.
2. Lift platform hinges.
  - a. Spray with penetrating oil to loosen debris.
  - b. Blow out with air and wipe down.
3. Master, slave and stow/deploy primary and secondary chains.
  - a. Spray with penetrating oil to loosen debris.
  - b. Wire brush if necessary. (Cleaning with steam or solvents on chains is NOT recommended).
4. Stow latch cylinder.
  - a. Wipe down if necessary.
5. Slide Channels
  - a. Wipe off excessive chain lube. (Slide channels should be dry and clean).

**NOTE:** The minor leaking of hydraulic fluid in an area near the stow latch cylinder is normal. Keep area clear of debris and accumulated oil.

### RUST PREVENTION



PROPER PREVENTATIVE MAINTENANCE REQUIRES THAT VISIBLE SURFACE RUST BE ADDRESSED AND CORRECTED IN A TIMELY AND APPROPRIATE MANNER. FAILURE TO DO SO MAY CAUSE IRREVERSIBLE DAMAGE TO THE LIFT MECHANISM.

#### If rust is present:

1. Grind or brush affected area to remove existing rust.
2. Prime area with epoxy primer.
3. Paint area with high quality gloss black epoxy paint.



### INSPECTION

Verify the following lift components are adjusted properly and do not exhibit excessive wear or overload characteristics.

1. Lift cylinder master chains and connecting links.
2. Slave chains, connecting links, and turnbuckles.
3. Outer barrier, outer barrier linkage, and linkage pivot points.
4. Inner barrier, inner barrier linkage, and linkage pivot points.
5. Lift cylinders, outer barrier cylinder, and inner barrier cylinder.
6. All lift mechanism pivot points.

If excessive wear, damage, or overload is suspected, replace the component. Procedures for replacing chain, cylinders and lift arms can be found in section 7.

Complete the **Preventive Maintenance Schedule** found at the end of this section.

### LUBRICATION

Lubrication of the lift mechanism is required during regular lubrication of the coach. All pivot points, other than those listed below, are permanently lubricated and do not require further lubrication unless the lift is disassembled.

Clean then lubricate the following components with corrosion control grease, (P/N P515-0014):

1. Lift cylinder master chains.
2. Primary and secondary stow/deploy drive chains.
3. Slave chains.
4. Inner barrier clevis pins and linkage pin.
5. Lift cylinder clevis pin
6. Stow latch clevis pin.

Lubricate the following components with quality multipurpose, lithium soap grease, grade EP-2, through grease fittings provided:

1. Torque shaft crutch.

Lubricate the following components with a thin coating of anti-seize:

1. Outer barrier linkages pins.
2. Stow latch striker plate

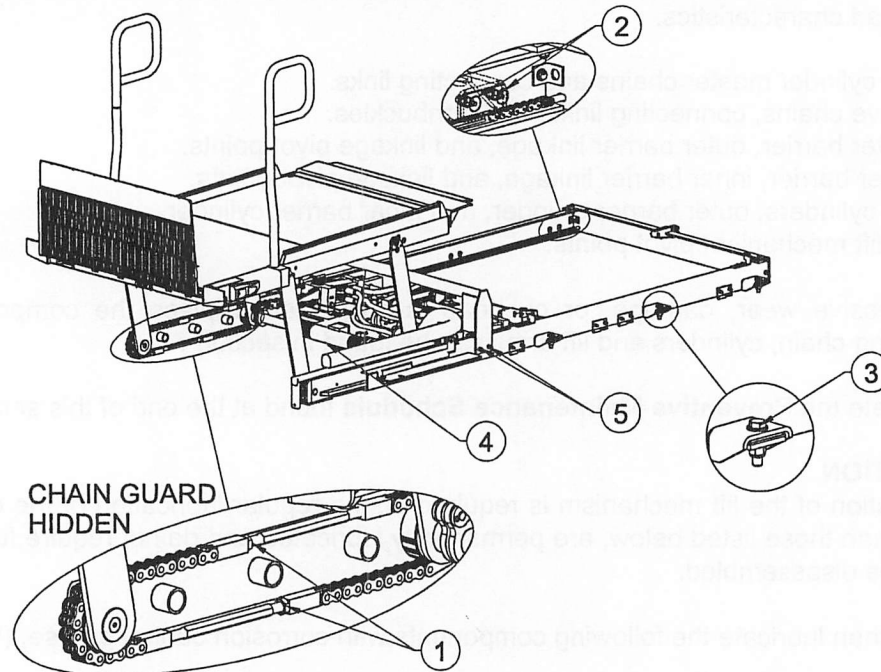


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## Section 4 MAINTENANCE

### FASTENERS

The LU10 platform lift uses stainless steel fasteners almost exclusively. The diagram below illustrates areas where zinc plated alloy fasteners are used.



**STAINLESS STEEL FASTENERS DO NOT HAVE THE TENSILE STRENGTH OF ALLOY STEEL FASTENERS. IN ADDITION, STAINLESS STEEL FASTENERS, WHEN IN CONTACT WITH PLATED COMPONENTS, CAN CAUSE RAPID DECAY OF THE PLATING. IF THE FASTENERS ILLUSTRATED ABOVE MUST BE REPLACED, THEY MUST BE REPLACED BY FASTENERS OF THE PROPER GRADE WITH THE PROPER PLATING.**



Item	Description	Grade	Plating	Torque
1	Turnbuckle (1/2-20 jam nut)	2	Zinc	32 ft-lbs
2, 5	Frame Mount/RS Cross member (3/8-24 flat head cap screw H.E.T. Tested)	8	Yellow Zinc	26 ft-lbs
2, 5	Frame Mount/RS Cross member (3/8-24 locknut)	8	Yellow Zinc	26 ft/lbs
3	Lift Mount (1/2-20 hex head hup screw)	5	Yellow Zinc	64 ft-lbs
3	Lift Mount (1/2" SAE hi-strength washer)	N/A	Yellow Zinc	N/A
3	Lift Mount (1/2-20 locknut)	8	Yellow Zinc	64 ft-lbs
4	Torque Shaft Coupling (3/8-24 set screw)	N/A	Black Oxide	26 ft-lbs

All fasteners on the platform lift, except the ones listed above, are stainless steel. The following torque values should be used unless otherwise noted.

### Torque values for SST fasteners

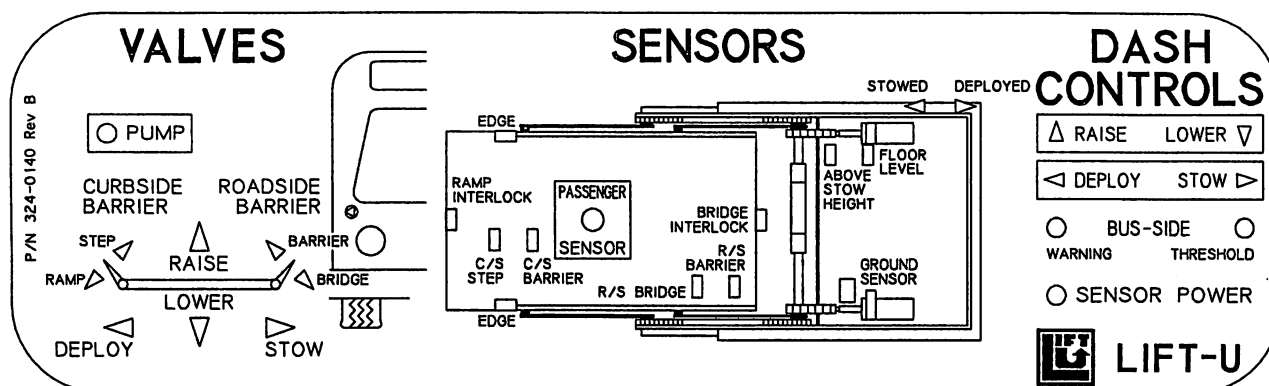
Fastener (coarse thread)		Fastener (fine thread)	
	Torque		Torque
10-24	26 in-lbs	10-32	30 in-lbs
1/4-20	66 in-lbs	1/4-28	75 in-lbs
5/16-18	11 ft-lbs	5/16-24	13 ft-lbs
3/8-16	20 ft-lbs	3/8-24	23 ft-lbs
7/16-14	32-ft-lbs	7/16-20	32 ft/lbs
1/2-13	36 ft/lbs	1/2-20	36 ft/lbs



STAINLESS STEEL FASTENERS WILL GALL AND SEIZE IF THE THREADS ARE NOT LUBRICATED. ALWAYS APPLY ANTI-SEIZE LUBRICANT BEFORE ASSEMBLING STAINLESS STEEL FASTENERS. IN SOME CASES, IT MAY BE HELPFUL TO APPLY ANTI-SEIZE TO EXPOSED THREADS BEFORE DISASSEMBLY.



### LIGHT EMITTING DIODE DISPLAY



The electrical control box has a light emitting diode (LED) display with a decal overlay designed to identify the various states of the lift mechanism. The inputs (dash control and sensor states) and outputs (hydraulic operations) are all identified with LED's. A lit LED indicates the corresponding input or output is active. Similarly, an unlit LED indicates the corresponding input or output is inactive. Since the state of all inputs, outputs, and sensors can be seen at a glance, the LED display can assist maintenance personnel when troubleshooting.

Bus-side inputs appear on the right side of the decal. Bus-side inputs include the dash controls and the threshold sensor. A lit LED confirms the control box is receiving the input from the dash controls.

At the center of the decal is a diagram of the lift assembly where all sensors are represented by an LED. A lit LED confirms the control box is receiving the input from the corresponding sensor. Before the lift can respond to an input from the dash control, the correct combination of sensors must be active. **The Switch Activation Chart in Section 8 lists the combination of sensors that must be active for common lift positions. The Lift Position Chart in Section 8 diagrams the most common lift positions.**

The LED's corresponding to the outputs are on the left side of the decal. Each hydraulic function has a corresponding LED to indicate when the function is active. For added clarity, each LED is in the shape of an arrow that points in the direction of motion.





					<b>LIFT-U® LU10 - PLATFORM LIFT</b>
					<b>PREVENTIVE MAINTENANCE SCHEDULE</b>
DAILY	6 WEEKS	6 MONTHS	OTHER	MANUAL REFERENCE SECTION / PAGE	ITEM DESCRIPTION (manual sectional references where applicable)
X				S2 - 3	CYCLE LIFT
X X				S1 - 11	TEST SAFETY FEATURES: A - PRESSURE SENSITIVE MATS B - PRESSURE SENSITIVE EDGES
	X X X				INSPECT HANDRAILS: A - STRUCTURAL INTEGRITY B - BOLTS SECURED C - CRACKS IN TUBING
	X X X X X	X  X X		VISUAL S5 - 5 VISUAL S5 - 29 S5 - 29 VISUAL S4 - 3	INSPECT OUTER BARRIER, LINKAGE, AND CYLINDER: A - STRUCTURAL INTERGRITY OF BARRIER B - BARRIER ANGLE C - PIVOT POINTS FOR DAMAGE OR WEAR D - RETAINING RINGS/JAM NUTS E - CYLINDER ATTACHMENT BOLTS F - HYDRAULIC HOSES/FITTINGS FOR LEAKS G - LUBRICATION (LUBE WITH ANTI-SEIZE COMPOUND) 1-LINKAGE PINS
	X X X X X X	X		VISUAL S5 - 6 VISUAL S5 - 31 VISUAL VISUAL S4 - 3	INSPECT INNER BARRIER, LINKAGE, AND CYLINDER: A - STRUCTURAL INTERGRITY OF BARRIER B - BARRIER ANGLE C - PIVOT POINTS FOR DAMAGE OR WEAR D - RETAINING RINGS / JAM NUTS E - CYLINDER CLEVIS PIN KEEPERS F - HYDRAULIC HOSES/FITTINGS FOR LEAKS G - CYLINDER CLEVIS PINS - REMOVE, INSPECT, LUBRICATE (LUBE WITH P/N P515-0014)
	X X X	X		S4 - 2 VISUAL S5 - 19 S4 - 3	INSPECT LIFT MASTER CHAINS AND CONNECTING LINKS: A - RUST B - ABSENSE OF COTTER PIN / KEEPERS C - PROPER ADJUSTMENT D - LUBRICATION (LUBE WITH P/N P515-0014)
	X X X X X			S4 - 2 VISUAL S5 - 22 S4 - 3 S5 - 23	INSPECT SLAVE CHAINS AND CONNECTING LINKS: A - RUST B - ABSENSE OF COTTER PIN / KEEPERS C - PROPER ADJUSTMENT D - LUBRICATION (LUBE WITH P/N P515-0014) E - JAM NUTS SECURED



# Section 4 MAINTENANCE

					<b>LIFT-U® LU10 - PLATFORM LIFT PREVENTIVE MAINTENANCE SCHEDULE</b>
DAILY	6 WEEKS	6 MONTHS	OTHER	MANUAL REFERENCE SECTION / PAGE	ITEM DESCRIPTION (manual sectional references where applicable)
	X X X X X			S4 - 2 VISUAL S5 - 25 S4 - 3 S5 - 25	<b>INSPECT SECONDARY STOW / DEPLOY CHAINS &amp; CONNECTING LINKS:</b> A - RUST B - ABSENCE OF COTTER PINS / KEEPERS C - PROPER ADJUSTMENT D - LUBRICATION (LUBE WITH P/N P515-0014) C - JAM NUTS SECURE
	X X X X			S4 - 2 VISUAL S5 - 27 S4 - 3	<b>INSPECT PRIMARY STOW / DEPLOY CHAIN AND CONNECTING LINK:</b> A - RUST / CORROSION B - ABSENCE OF COTTER PINS / KEEPERS C - PROPER ADJUSTMENT D - LUBRICATION (LUBE WITH P/N P515-0014)
	X X X			S5 - 16 VISUAL VISUAL	<b>INSPECT HYDRAULIC HOSE / ELECTRICAL CABLE BUNDLE:</b> A - PROPER ROUTING B - LEAKS (HOSES) C - CHAFING
		X X X		S5-27 HANDS-ON VISUAL VISUAL	<b>INSPECT STOW MOTOR AND STOW SHAFT:</b> A - SPROCKET ALIGNMENT B - SET SCREW TIGHT IN SPROCKETS C - HYDRAULIC HOSES / FITTINGS FOR LEAKS D - SPROCKETS FOR WEAR AND DAMAGE
		X X X		S5 - 9 S5 - 9	<b>INSPECT STOW / DEPLOY LIMIT SWITCH:</b> A - STOW SWITCH MUST ACTIVATE ½" BEFORE FULLY STOWED B - DEPLOY SWITCH MUST ACTIVATE ½" BEFORE FULLY DEPLOYED C - LOOSE LIMIT SWITCH ARM
	X X X X	X		S5 - 8 HANDS-ON HANDS-ON HANDS-ON	<b>INSPECT CHAIN LIMIT SWITCH (SLACK CHAIN):</b> A - ADJUSTMENT BETWEEN LIMIT SWITCH AND ARM TRIP B - LOOSE LIMIT SWITCH ARM C - FWD LIFT CYLINDER MUST OPERATE FREELY UP & DOWN (ALLOWING CHAIN LIMIT SWITCH TO OPERATE PROPERLY) D - LIFT CYLINDER CHAIN MUST BE FLEXIBLE (ALLOWING CHAIN LIMIT SWITCH TO OPERATE PROPERLY)
	X X			S5 - (1 - 7) S5 - (1 - 7)	<b>INSPECT PROXIMITY SWITCHES:</b> A - DAMAGE TO THE SENSING END B - GAP BETWEEN SENSING END AND TARGET ( GAP 0.030" TO 0.060")
	X X X			S5 - 28 VISUAL S4 - 3	<b>INSPECT CRUTCH BEARING:</b> A - PROPER ADJUSTMENT B - GALLING (TRANSFERRING PARTICLES OF BRASS TO THE TORQUE SHAFT COUPLING) C - LUBRICATION (LUBE WITH MULTI-PURPOSE GREASE)



<b>LIFT-U® LU10 - PLATFORM LIFT PREVENTIVE MAINTENANCE SCHEDULE</b>				
DAILY	6 WEEKS	6 MONTHS	OTHER	MANUAL REFERENCE SECTION / PAGE
				ITEM DESCRIPTION (manual sectional references where applicable)
				INSPECT HYDRAULIC POWER SOURCE:
	X			SPECIFICATION A – FLUID LEVEL
		X		S6 – 2 B – RELIEF VALVE PRESSURE (1250 P.S.I. +/- 25 P.S.I.)
		X		S6 – 2 C – CHANGE FILTER ELEMENT
			5 YRS	S6 – 2 D – REPLACE SOLENOID MOUNTED ON HYDRAULIC PUMP
		X		INSPECT LIFT MOUNTING BOLTS: REFERENCE LIFT-U TORQUE SPECIFICATION
		X		VISUAL INSPECT TORQUE SHAFT COUPLING SET SCREWS:
				VISUAL INSPECT SLIDE CHANNEL BEARING BLOCKS:
		X		NOTE: BLOCKS NEED REPLACING WHEN GAP BETWEEN BEARING BLOCK TOP SURFACE AND UPPER SLIDE CHANNEL RAILMENT IS GREATER THAN 3/16" WHEN PROPERLY ADJUSTED IN THE FULLY STOWED POSITION.
				VERIFY OPERATION OF HYDRAULIC SYSTEM: (RUN THE LIFT VERIFYING EACH CONDITION LISTED)
	X			VISUAL STOW, DEPLOY, RAISE, LOWER, ROADSIDE BARRIER UP & DOWN, CURBSIDE BARRIER UP & DOWN
	X			S3 INSPECT FOR "MANUAL OPERATING PROCEDURE" DECAL:
	X			S3 INSPECT FOR "MANUAL OPERATING PROCEDURE" DECAL WARNING STICKER:
	X			S5 – 19 INSPECT MAIN LIFT CYLINDERS, FORWARD & REAR:
	X			VISUAL A – CYLINDER CLEVIS PINS MUST BE FREE OF RUST AND CORROSION AND MUST MOVE FREELY
	X			HANDS-ON B – CYLINDER CLEVIS PINS – REMOVE AND LUBRICATE
	X			VISUAL C – CYLINDER CLEVIS PIN KEEPERS
	X			S5 – 19 D – JAM NUT MUST BE TIGHT AGAINST CYLINDER ROD
		X		S5 – 19 E – MINIMUM THREAD ENGAGEMENT OF 1" ON TURNBUCKLE BOLTS
	X			SPECIFICATION F – SPEED OF LIFT IN CUSION AREA
	X			S4 – 1 G – APPLY LUBRICANT TO CUSION ADJUSTMENT SCREW CAVITIES (LUBE WITH ANTI-SEIZE COMPOUND)
		X		INSPECT STOW / LATCH CYLINDER:
	X			S5 – 14 A – PROPER STOW / LATCH ENGAGEMENT
	X			VISUAL B – HYDRAULIC HOSE / FITTINGS FOR LEAKS
				S4 – 3 C – LUBRICATION ON STOW LATCH FACE (LUBE WITH DOOR-EAZE)
		X		S4 – (4,5) INSPECT ALL FASTENERS FOR TORQUE:
				VISUAL INSPECT PUSH-OFF SPRINGS: REPLACE SPRINGS EVERY 6 YEARS OR 8,000 CYLES



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## Section 4 MAINTENANCE

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# **Service Procedures**



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Hogan Mfg., Inc.

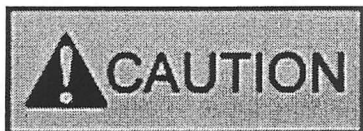
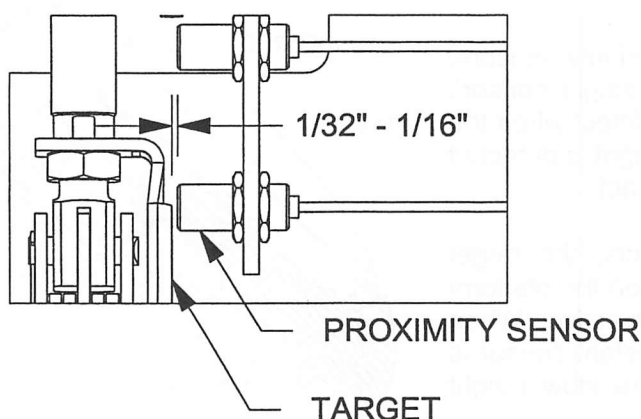
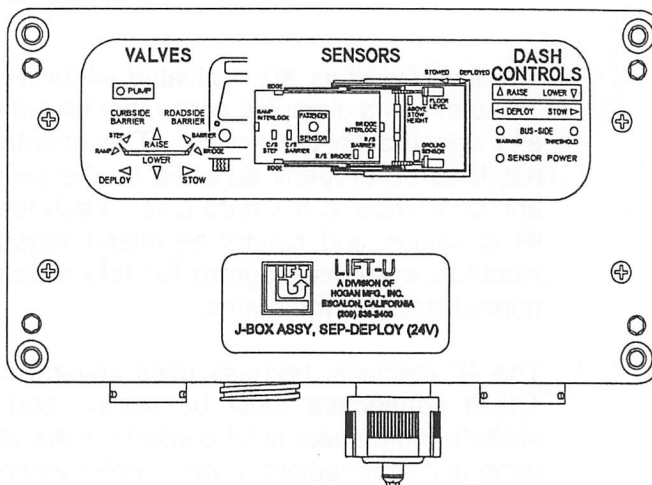
## Section 5

# SERVICE ADJUSTMENT PROCEDURES

### SENSOR ADJUSTMENTS

In addition to the dash controls, the lift controller receives input from 13 sensing devices. The sensitive mats and edges do not require any adjustment. However, the proximity sensors and limit switches may need occasional adjustment for optimal lift performance.

Proximity sensors will activate whenever a metallic object passes within range of the sensor's head. When active, an LED on the sensor will become illuminated. All proximity sensors on the lift are to be adjusted such that clearance between the sensor head and target is 1/32" to 1/16". If the gap is less than 1/32" there is a risk of collision between the target and the sensor. If the gap is greater than 1/16" the target may not activate the sensor.



THE TARGET AND PROXIMITY SWITCH MAY DAMAGE ONE ANOTHER WHEN THE AIR GAP IS REDUCED TO ZERO OR ADJUSTED SO THAT THE TARGET AND SWITCH COLLIDE. A DAMAGED SWITCH OR TARGET CAN CAUSE LIFT MALFUNCTIONS. THE CORRECT AIR GAP IS CRITICAL AND MUST BE ADJUSTED TO ALLOWABLE DIMENSIONS. DAMAGE TO A TARGET OR PROXIMITY SWITCH MAY CAUSE LIFT MALFUNCTIONS THAT MAY FURTHER DAMAGE THE LIFT AND MAY INJURE PASSENGERS.

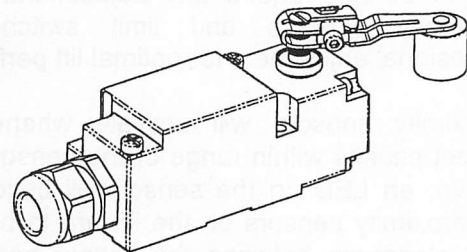
**NOTE:** Always handle proximity sensors with extreme care and avoid damage to the head of the sensor.





### SENSOR ADJUSTMENTS

The limit switches are activated when its arm is rotated. The arm has a clamping screw that allows it to be attached and oriented on the switch. The orientation of the arm needs to be properly adjusted so the switch can activate and deactivate at the right time. Each limit switch on the lift is unique and cannot be interchanged. Refer to the electrical systems diagram for information regarding the normal states of the switch.



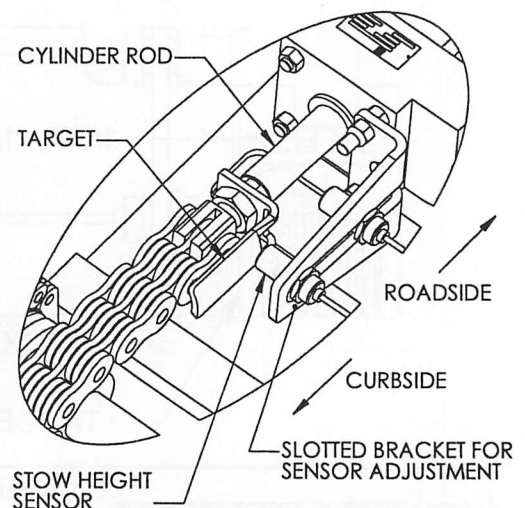
LIMIT SWITCH

The lift electrical harness uses several connector types. These connectors must be secure and their pins and sockets must make solid contact for the lift to operate correctly. Always confirm continuity and security through all connectors when troubleshooting the electrical system.

### STOW HEIGHT PROXIMITY SENSOR

Mounted to the rear lift cylinder are two proximity sensors. The curbside sensor is known as the 'stow height sensor'. The purpose of the stow height sensor is to detect when the platform reaches stow height. When stow height is detected by the controller, the platform will begin to retract.

As the lift cylinder rod extends and retracts, the target passes in front of the proximity sensors. When the platform is above stow height the stow height sensor is active. When the platform is below stow height the stow height sensor is inactive. Stow height is achieved when the stow height sensor changes from active to inactive.



WHEN ADJUSTING THE STOW-HEIGHT PROXIMITY SWITCH, MOVE THE SWITCH IN SMALL 1/16" INCREMENTS. ALWAYS CONFIRM THAT THE SENSITIVE EDGES WILL HAVE ADEQUATE CLEARANCE AT THE STEP RISER AND THAT THE GUIDE BLOCKS WILL PROPERLY ENTER THE SLIDE CHANNELS. THE SENSITIVE EDGES MAY BE DAMAGED BY THE STEP RISER IF THE PLATFORM ATTEMPTS TO STOW TOO HIGH. ALSO, THE PLATFORM MAY NOT REST SOLIDLY WITHIN THE SLIDE CHANNELS. THIS PREVENTS THE FIRST (ENTRY) STEP FROM BEING FIRMLY SUPPORTED BY THE CHANNELS. IN ADDITION, EXCESSIVE RATTLING AND VIBRATION MAY OCCUR.

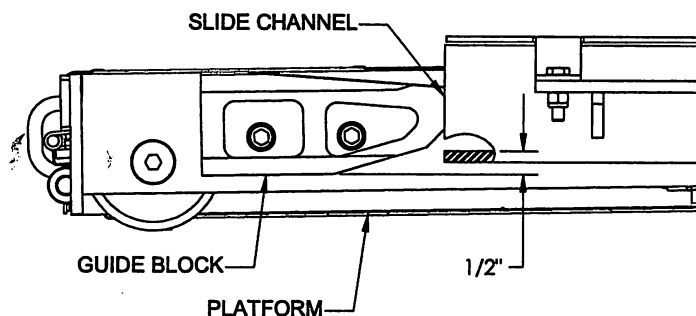


### SENSOR ADJUSTMENTS

#### STOW HEIGHT PROXIMITY SENSOR (continued)

When the 'Stow' function is selected the controller checks the state of the stow height sensor. If the stow height sensor is active, the controller lowers the platform. As soon as the sensor changes from active to inactive the platform stops; this is stow height. If the stow height sensor is inactive when 'Stow' is selected, the platform behavior is slightly different. The controller will raise the platform until the stow height sensor becomes active. Then, the controller will lower the platform. As soon as the sensor changes from active to inactive the platform stops; this is stow height.

The illustration shows the position of the guide block relative to the slide channel when the platform is at the proper stow height. As the guide block enters the slide channel, the platform should rise approximately 1/2".



#### IF THE PLATFORM STOWS TOO LOW

1. Loosen the stow height sensor jam nuts.
2. Move the stow height sensor **roadside**. (1/16" max)
3. Confirm air gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm stow level.
5. If the platform is still too low, repeat steps 1-4.

#### IF THE PLATFORM STOWS TOO HIGH

1. Loosen the stow height sensor jam nuts.
2. Move the stow height sensor **curbside**. (1/16" max)
3. Confirm air gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm stow level.
5. If the platform is still too high, repeat steps 1-4.

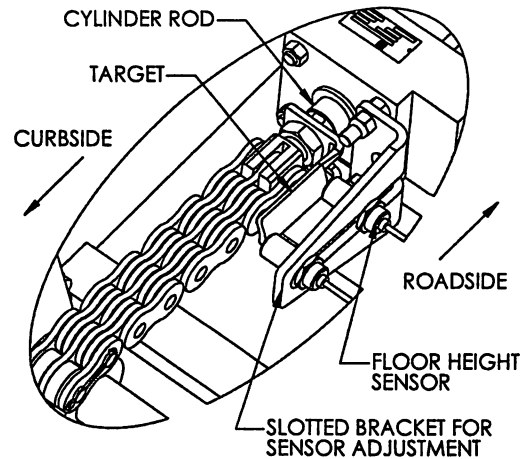
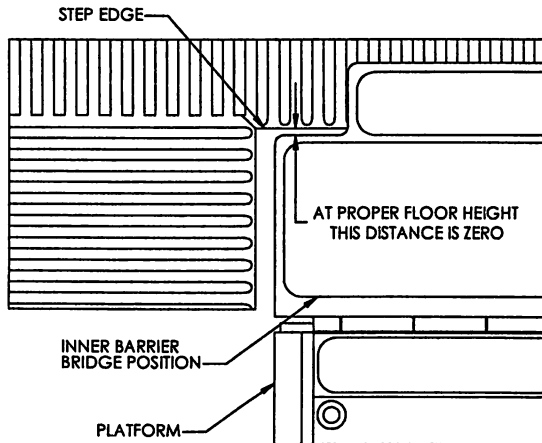


### SENSOR ADJUSTMENTS

#### FLOOR HEIGHT PROXIMITY SWITCH

Mounted to the rear lift cylinder is a pair of proximity sensors. The roadside sensor is known as the 'floor height sensor'. The purpose of the floor height sensor is to detect when the platform reaches the vehicle floor level. When floor level is detected by the controller, the inner barrier moves to bridge position.

The illustration below shows the platform at floor loading position. The floor height sensor is adjusted properly when the edge of the notch in the bridge barrier is adjacent to the step edge.



#### IF THERE IS A GAP

1. Loosen the floor height sensor jam nuts.
2. Move the floor height sensor **roadside**. (1/16" max)
3. Confirm air gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm floor level.
5. If the gap still exists, repeat steps 1-4.

#### IF THERE IS OVERLAP

1. Loosen the floor height sensor jam nuts.
2. Move the floor height sensor **curbside**. (1/16" max)
3. Confirm air gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm floor level.
5. If overlap still exists, repeat steps 1-4.



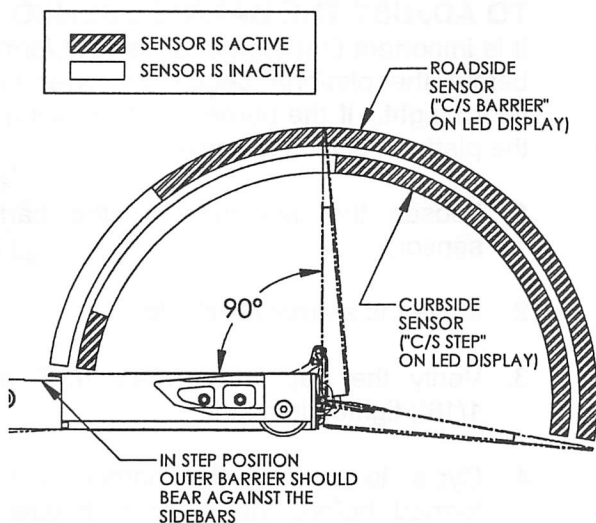
### SENSOR ADJUSTMENTS

#### OUTER BARRIER PROXIMITY SENSORS

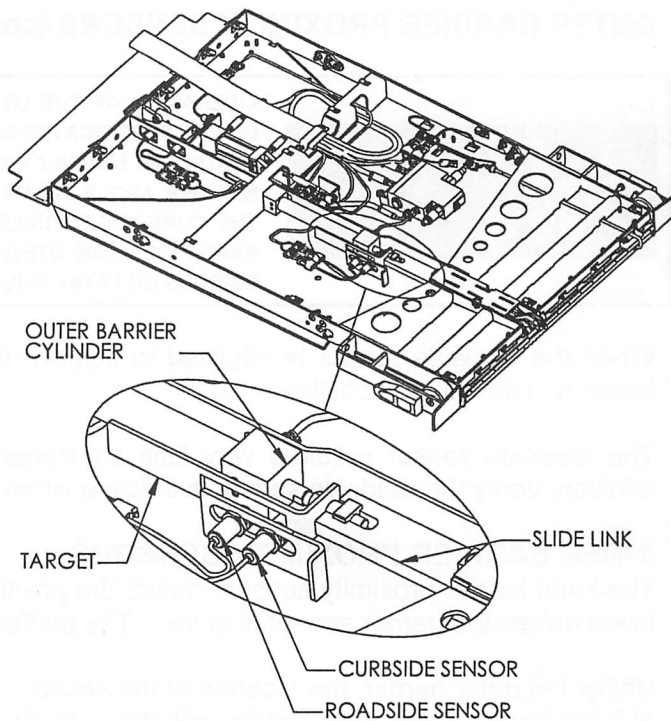
The outer barrier proximity sensors work together to set the barrier angle and detect when it's safe to stow the platform. The position of the curbside sensor sets the barrier angle and detects step position. The roadside sensor helps the controller distinguish between ramp and step position.

Before any adjustments are made to the outer barrier sensors, the slide link must be adjusted properly. Refer to the section on mechanical adjustment for the slide link adjustment procedure.

The diagram below illustrates the states of the proximity switches as the barrier moves between the step and ramp positions. Notice the curbside sensor is inactive when the barrier is at 90°



SENSOR STATES FOR ALL OUTER BARRIER POSITIONS



#### IF THE DEPLOYED ANGLE IS MORE THAN 90°

1. Loosen the curbside sensor jam nuts.
2. Move the curbside sensor **roadside**.
3. Confirm air gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm barrier angle.

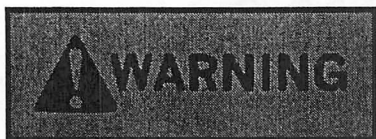
#### IF THE DEPLOYED ANGLE IS LESS THAN 90°

1. Loosen the curbside sensor jam nuts.
2. Move the curbside sensor **curbside**.
3. Confirm air gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm barrier angle.



### SENSOR ADJUSTMENTS

#### OUTER BARRIER PROXIMITY SENSORS (continued)



OPERATION OF THE LIFT WHEN THE CURBSIDE BARRIER ANGLE IS NOT WITHIN THE GIVEN SPECIFICATIONS COULD ALLOW PASSENGER TO FALL FROM THE LIFT PLATFORM. NEVER CARRY PASSENGERS ON THE LIFT PLATFORM WHEN THE CURBSIDE BARRIER ANGLE IS NOT TO GIVEN SPECIFICATIONS. BEFORE RESUMING OPERATION, THE CURBSIDE BARRIER ANGLE MUST BE ADJUSTED TO SPECIFICATION. SHOULD A PASSENGER (OR OTHERS) FALL FROM THE LIFT PLATFORM, THEY COULD RECEIVE SERIOUS OR FATAL INJURIES.

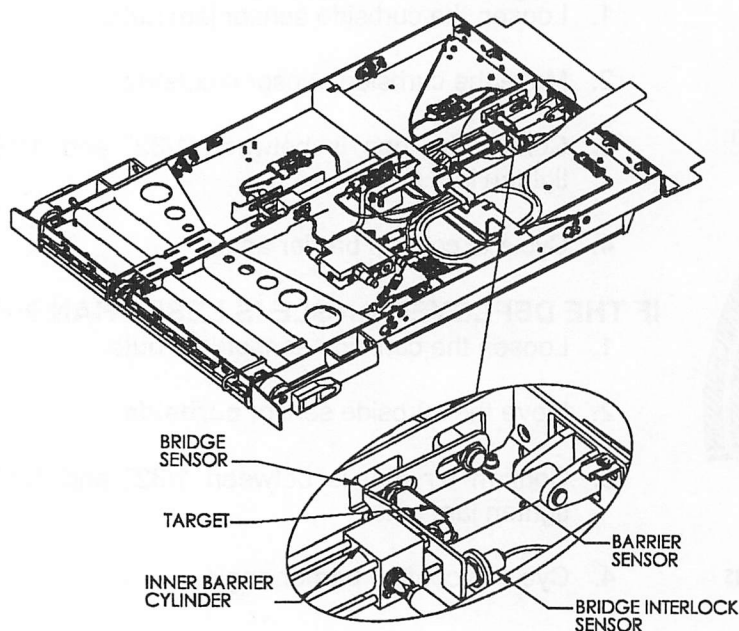
When the curbside sensor is adjusted to achieve the proper barrier angle, it will also be in the correct location to detect step position.

The roadside sensor requires very little adjustment. Verify the gap is between 1/32" and 1/16". In addition, verify the roadside sensor is inactive when the outer barrier is in the step position.

#### INNER BARRIER PROXIMITY SENSORS

The inner barrier proximity sensors detect the position of the inner barrier. The platform will not raise or lower unless the barrier sensor is active. The platform will not stow unless the bridge sensor is active.

Unlike the outer barrier, the location of the sensors in their slotted bracket has no influence on the angle of inner barrier. The inner barrier cylinder extends fully to form the barrier and retracts fully to form the bridge.



#### TO ADJUST THE BARRIER SENSOR

It is important that the barrier is fully formed before the platform begins to lower from floor height. If the barrier is still moving as the platform begins to lower:

1. Loosen the jam nuts on the barrier sensor.
2. Move the sensor **roadside**.
3. Verify the gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm the barrier is fully formed before the platform begins to lower.
5. Repeat steps 1-4 as necessary.



### SENSOR ADJUSTMENTS



RAISING OR LOWERING THE PLATFORM BEFORE THE INNER BARRIER HAS FULLY FORMED COULD ALLOW THE PASSENGER TO FALL. NEVER CARRY PASSENGERS ON THE PLATFORM IF THE CONTROLS ALLOW THE LIFT TO LOWER BEFORE THE INNER BARRIER HAS FORMED.



BEFORE PLACING THE PLATFORM LIFT INTO SERVICE, THE ROADSIDE BARRIER ANGLE MUST BE ADJUSTED TO SPECIFICATION. A PASSENGER COULD RECEIVE SERIOUS INJURIES BY FALLING FROM THE PLATFORM.

#### INNER BARRIER PROXIMITY SENSORS (continued)

##### TO ADJUST THE BRIDGE SENSOR

Damage to the inner barrier and bus may occur unless the bridge is fully formed before the platform retracts from stow height. As the platform is retracted into the vehicle, verify the inner barrier is clear of the step riser. Use the following procedure to **increase** the clearance between the inner barrier and the step riser

1. Loosen the jam nuts on the bridge sensor.
2. Move the sensor **curbside**.
3. Verify the gap is between 1/32" and 1/16"; tighten jam nuts.
4. Cycle to confirm the bridge is fully formed before the platform begins to lower.
5. Repeat steps 1-4 as necessary.

##### BRIDGE INTERLOCK PROXIMITY SENSOR

The bridge interlock proximity sensor is active during normal operation of the lift. As the inner barrier cycles from bridge to barrier position the cylinder pivots about a clevis pin. Since the target is attached to the inner barrier cylinder, the target also moves in an arcing motion. Verify the gap is between 1/32" and 1/16" throughout the range of the target's motion.





### SENSOR ADJUSTMENTS

#### CHAIN LIMIT SWITCH

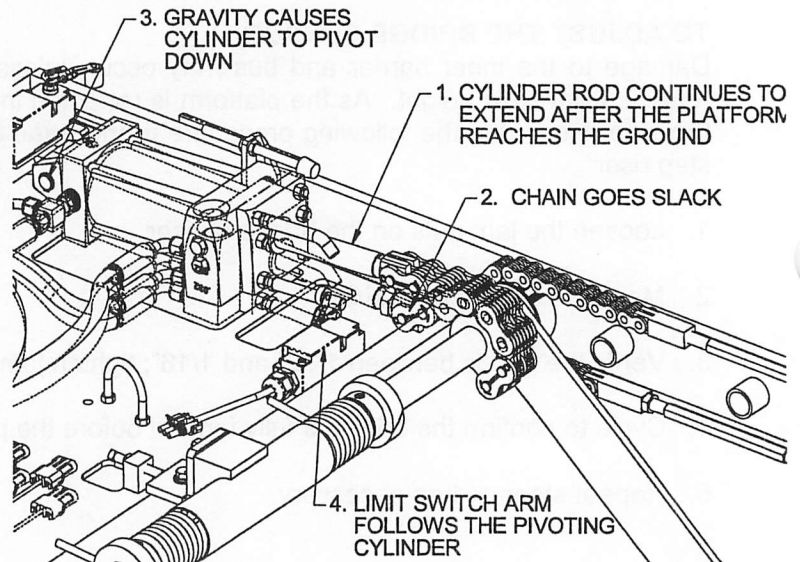
The chain limit switch is a two-position switch located near the forward lift cylinder. The chain limit switch is active at all platform positions above ground level. When the platform reaches ground level the chain limit switch becomes inactive. The outer barrier will move to the ramp position only when the chain limit switch is inactive.



THE CHAIN LIMIT SWITCH WILL BE ACTIVE AT ALL TIMES, EXCEPT WHEN THE LIFT PLATFORM IS AT GROUND LEVEL. NEVER CARRY PASSENGERS OR ATTEMPT TO LOAD PASSENGERS WHEN THE CHAIN LIMIT SWITCH IS NOT OPERATING PROPERLY. DURING INSTALLATION, SERVICING AND BEFORE PLACING THE LIFT MECHANISM IN SERVICE, THE CHAIN LIMIT SWITCH MUST BE FUNCTIONING PROPERLY. A PASSENGER COULD RECEIVE SERIOUS OR FATAL INJURIES BY FALLING FROM THE LIFT PLATFORM.

The diagram to the right illustrates how the chain limit switch is used to sense ground. In order for the switch to sense ground both the cylinder and the chain must be able to move freely. If either the cylinder clevis pin or the chain is 'frozen', the cylinder may not be able to pivot. If this happens the chain limit switch will not be able to deactivate.

The pivot of the lift cylinder should allow the limit switch arm to lower approximately 0.375" (3/8") before the switch becomes neutral.



#### TO ADJUST THE CHAIN SWITCH:

1. Lower the lift to ground level.
2. With the chain limit switch held activated, achieve full extension of the lift cylinder shaft. Hold the lift cylinder up to keep the lift chain from contacting the master sprocket.
3. With the lift cylinder fully extended and the chain in the full slack condition let the cylinder rest on the power platform
4. Loosen the screw on chain limit switch arm.
5. Tighten the limit switch arm on the limit switch head such that roller on the limit switch arm is 1/4" above the trip bracket. The chain limit switch will be in the neutral condition when the lift cylinders are within 1/4" of the full slack condition.
6. Cycle and confirm adjustment as required.



### SENSOR ADJUSTMENTS



STIFF, FROZEN OR CORRODED PIVOT PINS, PIVOT POINTS AND CHAIN SEGMENTS WILL NOT ALLOW FREE MOVEMENT OF THE LIFT CYLINDERS. LOOSEN STIFF OR FROZEN COMPONENTS, LUBRICATE OR REPLACE AS REQUIRED. STIFF OR FROZEN COMPONENTS MAY CAUSE LIFT MALFUNCTIONS THAT MAY FURTHER DAMAGE THE LIFT AND MAY INJURE PASSENGERS.

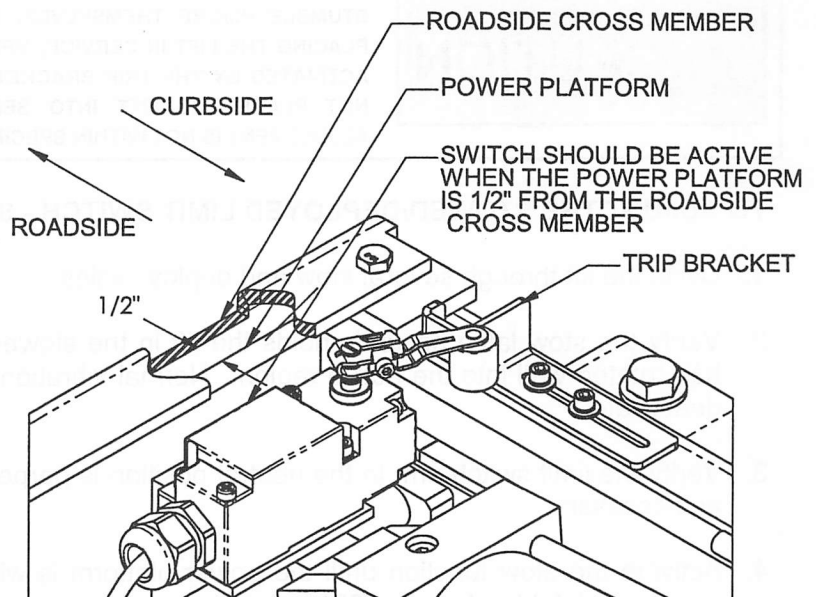
#### STOWED / DEPLOYED LIMIT SWITCH



WITHIN THE STOWED/DEPLOYED LIMIT SWITCH IS ELECTRICAL LOGIC THAT PROVIDES A CIRCUIT FOR THE BUS-SIDE INTERLOCKS. THE BUS-SIDE INTERLOCK FEATURES ARE ENGAGED WITH RESPECT TO THE OPERATION OF THE STOWED/DEPLOYED LIMIT SWITCH. CONSULT THE BUS MANUFACTURER FOR FURTHER INFORMATION REGARDING BUS-SIDE INTERLOCK FEATURES, PROCEDURES, ADJUSTMENT AND SEQUENCES.

The stowed/deployed limit switch is a three-position switch that "senses" the position of the lift within the slide channels. The three positions are referred to as: 'stowed', 'not stowed', and 'deployed'.

The limit switch must be in the 'stowed' position for normal operation of the bus. If the switch is in the 'not stowed' or 'deployed' position the bus side interlocks may engage. The interlocks may not be released until the limit switch returns to the stowed position. Finally, the platform will not raise or lower unless the switch is in the deployed position.



STOWED POSITION

Even though the stowed/deployed limit switch looks similar to the chain limit switch, the two may not be interchanged. Consult the electrical system diagram for further information regarding the electrical characteristics of the stowed/deployed limit switch. Refer to the assembly drawings for the correct replacement part number.

The stowed/deployed limit switch in the diagram is shown mounted to the forward side of the lift. Some configurations have the limit switch and trip brackets mounted to the rear of the lift.



### SENSOR ADJUSTMENTS



THE LIFT MUST REACH A POSITION WHERE IT CAN BE HELD SECURE BY THE STOW LATCH. DAMAGE TO THE LIFT MAY OCCUR IF THE VEHICLE IS OPERATED WHILE THE LIFT NOT SECURELY STOWED. THE STOWED/DEPLOYED LIMIT SWITCH MUST BE ACTIVATED BY THE ROADSIDE TRIP BRACKET 1/2" PRIOR TO THE ROADSIDE LIMIT OF TRAVEL. DO NOT PLACE THE LIFT INTO SERVICE IF THE STOWED/DEPLOYED LIMIT SWITCH ADJUSTMENT IS NOT WITHIN SPECIFICATION.

#### STOWED / DEPLOYED LIMIT SWITCH - STOWED POSITION

The stowed/deployed limit switch must be activated by the roadside trip bracket 1/2" prior to the roadside limit of travel. If the stowed/deployed limit switch activates too soon the stow latch may not be able to securely hold the lift in stowed position. If the stowed/deployed limit switch trips too late the bus-side interlock features may not release.



INCOMPLETE OR IMPROPER STOWING OF THE LIFT MAY CAUSE PASSENGERS TO STUMBLE INJURE THEMSELVES. DURING SERVICING, INSTALLATION, AND BEFORE PLACING THE LIFT IN SERVICE, VERIFY THAT THE STOWED/DEPLOYED LIMIT SWITCH IS ACTIVATED BY THE TRIP BRACKET 1/2" PRIOR TO REACHING THE TRAVEL LIMIT. DO NOT PLACE THE LIFT INTO SERVICE IF THE STOWED/DEPLOYED LIMIT SWITCH ADJUSTMENT IS NOT WITHIN SPECIFICATION.

#### TO ADJUST THE STOWED/DEPLOYED LIMIT SWITCH - STOWED POSITION:

1. Cycle the lift through several stow and deploy cycles.
2. Verify the stow latch securely holds the lift in the stowed position. Also, verify the limit switch arm has rotated well into the active region. Normal vibrations of the bus should not cause the switch to deactivate.
3. Verify the limit switch arm in the neutral position is perpendicular to the lift direction of travel. Adjust as necessary.
4. Activate the stow function until the power platform is within 1/2" of the roadside cross member. It may be helpful to place a 1/2" block between the power platform and the roadside cross member to act as a stop.
5. Loosen the screws and move the trip bracket curbside until the switch changes from inactive to active. Adjust the position of the trip bracket only. Never adjust the position of the limit switch arm.
6. Tighten the screws on the trip bracket and cycle the lift through several stow and deploy cycles to verify the adjustment.



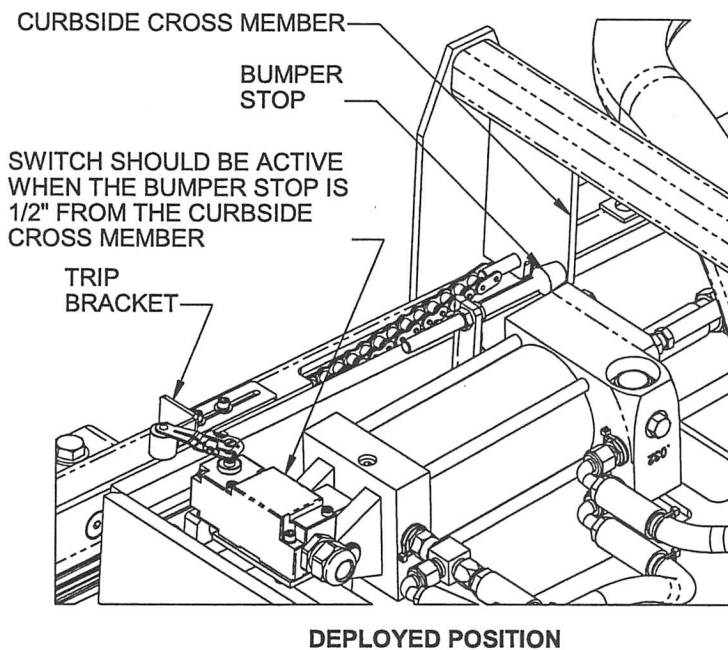
### SENSOR ADJUSTMENTS

#### STOWED / DEPLOYED LIMIT SWITCH - DEPLOYED POSITION



THE PLATFORM MAY INTERFERE WITH THE STEPS OF THE BUS IF IT IS OPERATED WITH THE LIFT AT AN IMPROPER DEPLOY DISTANCE. BEFORE ADJUSTING THE CURBSIDE TRIP BRACKET ADJUST THE BUMPER STOP TO ACHIEVE THE PROPER DEPLOY DISTANCE. SEE THE SECTION ON MECHANICAL ADJUSTMENTS.

DURING INSTALLATION, SERVICING, AND BEFORE PLACING THE LIFT IN SERVICE, VERIFY THAT THE STOW/DEPLOY LIMIT SWITCH IS ACTIVATED BY THE CURBSIDE TRIP BRACKET APPROXIMATELY 0.5" (1/2") INCH PRIOR TO THE LIFT REACHING THE CURBSIDE TRAVEL LIMIT. DO NOT PLACE THE LIFT INTO SERVICE IF THIS ADJUSTMENT IS NOT WITHIN SPECIFICATION.



The stowed/deployed limit switch must be activated by the curbside trip bracket 1/2" prior to the curbside limit of travel. If the stowed/deployed limit switch activates too soon the lift may not achieve its proper deploy distance. The proper deploy distance ensures the platform will clear the steps at it is raised to floor position. If the stowed/deployed limit switch activates too late it may become inactive while the platform is in use. The platform will not raise or lower unless the stowed/deployed limit switch is active in the deployed position.

Before proceeding with the limit switch adjustment, verify the bumper stops are adjusted correctly to achieve the proper deploy distance. See the section on mechanical adjustment.

#### TO ADJUST THE STOWED/DEPLOYED LIMIT SWITCH - DEPLOYED POSITION:

1. Cycle the lift through several stow and deploy cycles.
2. Verify the bumper stop is firmly against the curbside cross member. Also, verify the limit switch arm has rotated well into the active region. Normal vibrations of the bus should not cause the switch to deactivate.



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## Section 5

# SERVICE ADJUSTMENT PROCEDURES

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3. Verify the limit switch arm in the neutral position is perpendicular to the lift direction of travel. Adjust as necessary.
4. Activate the deploy function until the bumper stop is 1/2" from the curbside cross member. It may be helpful to place a 1/2" block between the bumper stop and the curbside cross member to act as a stop.
5. Loosen the screws and move the trip bracket roadside until the switch changes from inactive to active. Adjust the position of the trip bracket only. Never adjust the position of the limit switch arm.
6. Tighten the screws on the trip bracket and cycle the lift through several stow and deploy cycles to verify the adjustment.



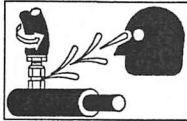


## HYDRAULIC ADJUSTMENTS

### GENERAL HYDRAULIC ADJUSTMENTS



OPENING OR REMOVING ANY HYDRAULIC COMPONENT THAT IS UNDER PRESSURE COULD CAUSE LIFT MECHANISM MOVEMENT AND COULD RELEASE OIL UNDER PRESSURES OF UP TO 2000 PSI. PERSONNEL NEAR THE LIFT COULD BE SPRAYED WITH THE OIL AND/OR IMPACTED BY THE MOVING LIFT MECHANISM.



RELIEVE HYDRAULIC PRESSURE IN THE SYSTEM BEFORE ATTEMPTING TO OPEN AND/OR REMOVE ANY HYDRAULIC COMPONENT. DO NOT OPEN ANY HYDRAULIC CIRCUIT WHILE IT IS, OR COULD BE, UNDER PRESSURE. WEAR SAFETY GLASSES WHENEVER SERVICING THE LIFT HYDRAULIC SYSTEMS. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY FROM OIL SPRAYING INTO THE EYES, OIL BURNS, AND/OR IMPACT BY A WHIPPING HYDRAULIC HOSE.



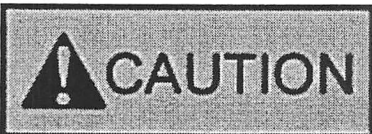
THE LIFT PLATFORM MUST BE SOLIDLY SUPPORTED BEFORE SERVICING THE LIFT'S RAISE/LOWER HYDRAULIC CIRCUIT. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY FROM BEING PINCHED/CRUSHED BY THE LIFT.

### LIFT CYLINDER CUSHION VALVES

Reference the Master Chain Adjustment Procedure

### STOW LATCH CYLINDER

The stow latch cylinder disengages the stow latch allowing the lift to deploy. The power platform must be latched in the stowed position to prevent the lift from drifting out when not in use.



IF THE STOW LATCH IS INCORRECTLY ADJUSTED, THE LIFT MECHANISM MAY DEPLOY UNEXPECTEDLY AND ENGAGE THE BUS-SIDE INTERLOCK SYSTEMS. THE DRIVER MAY BECOME DISTRACTED AND LOSE CONTROL OF THE COACH. THIS MAY CAUSE PASSENGER INJURY AND COACH DAMAGE. DURING INSTALLATION, SERVICING, AND BEFORE PLACING THE LIFT IN SERVICE, VERIFY THE STOW LATCH CYLINDER DOES NOT PREVENT THE STOW LATCH FROM SEATING.





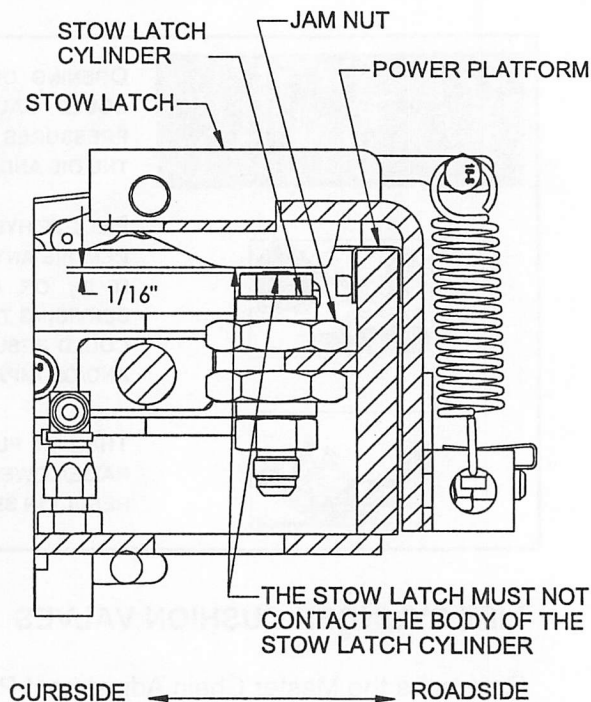
### HYDRAULIC ADJUSTMENTS

#### STOW LATCH CYLINDER (continued)

Proper stow latch engagement with the power platform is between 1/8" and 1/4". The stow latch cylinder is extended by pilot pressure from the same port that deploys the lift. The stow latch cylinder then engages the stow latch causing it to release. The vertical position of the stow latch cylinder must be adjusted so it's extension is sufficient to release the stow latch from it's engagement with the power platform.

#### IF THE STOW LATCH WILL NOT RELEASE:

1. Place the lift in stowed position
2. Loosen top and bottom jam-nut on stow latch cylinder.
3. Adjust the stow latch cylinder so the plunger cover barely contacts the stow latch. This will give the 1/16" dimension indicated in the diagram on the right.
4. Cycle the lift to confirm the setting.
5. If the stow latch fails to release, confirm the amount of hydraulic flow and pressure to the stow latch cylinder.





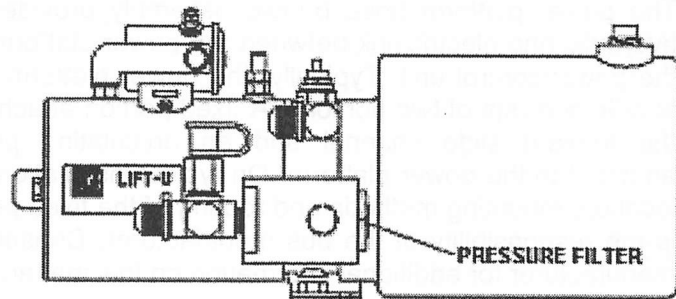
### HYDRAULIC ADJUSTMENTS

#### RELIEF VALVE ON THE POWER PACK

The power pack uses an electric motor to rotate a pump that draws fluid from a separate reservoir. This allows the use of hydraulic fluids specially suited for cold weather applications.

**NOTE:** The fluid used in the lift hydraulic is not the same type used in the vehicle hydraulic system. Consult the bus manufacturer for information on hydraulic fluid requirements.

HYDRAULIC POWER PACK



WITH THE POWER PACK SYSTEM, THE MAXIMUM AMOUNT OF CURRENT DRAW WITH THE SYSTEM UNDER LOAD IS 120 AMPS. IN ALL CASES, THE TYPE AND RATING OF THE CIRCUIT PROTECTION FOR THE POWER PACK IS PROVIDED BY THE BUS MANUFACTURER. CONSULT BUS MANUFACTURER FOR TYPE, RATING AND LOCATION OF CIRCUIT PROTECTION. FAILURE TO PROVIDE CIRCUIT PROTECTION MAY RESULT IN DAMAGE TO THE POWER PACK.

The hydraulic power pack has an adjustable relief valve. This valve will limit the amount of pressure the power pack can generate when the hydraulics stall. The proper relief valve pressure is listed on the specifications page.

#### TO ADJUST RELIEF VALVE:

1. Attach a 2000-psi pressure gauge to the test port between the power pack and the hydraulic control assembly.
2. With the lift power switch "on" and the lift at floor loading position, select the "raise" function. Hold the function switch while reading gage or adjusting the relief valve.



THE LIFT MUST BE AT FLOOR LOADING POSITION OR AT THE FULL MECHANICAL LIMIT OF A FUNCTION PRIOR TO ADJUSTING THE RELIEF VALVE SETTING. FAILURE TO DO SO MAY RESULT IN THE LIFT HYDRAULICS NOT ACHIEVING FULL RELIEF VALVE PRESSURE.

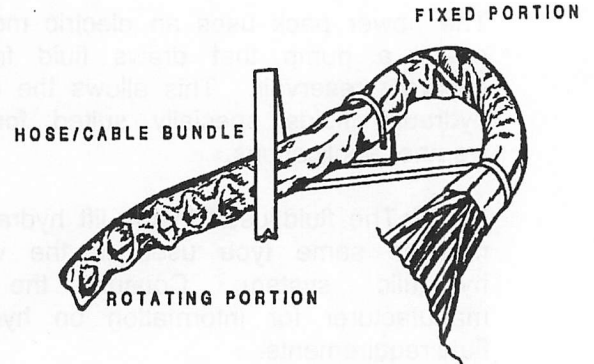
3. Loosen the cap on the relief valve cartridge.
4. Adjust the slotted relief valve cartridge until the desired pressure is achieved.
5. Replace cap, re-select the "raise" function to confirm adjustment. Readjust as required.



### HYDRAULIC ADJUSTMENTS

#### HOSE BUNDLE ASSEMBLY - POWER PLATFORM

The power platform hose bundle assembly provides the hydraulic and electric link between the power platform and the power/control unit. Typically, the power platform hose bundle consists of two portions. A fixed portion attached to the forward slide channel and an articulating portion attached to the power platform. On typical installations the location, mounting methods and routing of the fixed portion is the responsibility of the bus manufacturer. Consult bus manufacturer for additional information on this matter.



DO NOT PLACE THE LIFT INTO SERVICE IF THE HOSE BUNDLE ASSEMBLY IS DAMAGED OR MAY BE DAMAGED BY OPERATION. A DAMAGED HOSE OR CABLE MAY CAUSE DAMAGE TO THE LIFT, DAMAGE TO THE COACH, AND/OR PASSENGER INJURY.

IF THE HOSE BUNDLE ASSEMBLY IS PINCHED, CRUSHED, OVER-STRESSED, OR OTHERWISE DAMAGED, IT MAY FAIL. DURING INSTALLATION, SERVICING, AND BEFORE PLACING THE LIFT IN SERVICE, VERIFY THE HOSE BUNDLE WILL OPERATE FREELY THROUGHOUT THE LIFT CYCLE. PERIODICALLY INSPECT THE HOSES AND ELECTRIC CABLE IN THE HOSE BUNDLE FOR DAMAGE.

#### TO ADJUST THE HOSE BUNDLE ASSEMBLY FROM THE POWER/CONTROL UNIT TO THE POWER PLATFORM:

1. Remove splash shield.
2. Operate the lift through several stow/deploy operations. Observe the articulation of the hose bundle assembly. It should operate clear of lift cylinders, switches, steering gear, bumper brackets, tubes and other fixed or moving components.
3. Loosen clamp attaching hose/cable assembly to forward slide channel assembly.
4. Stow the lift.
5. Tension hose bundle assembly so that it sags between 1/2" and 1" when the lift is stowed.
6. Operate the lift through several stow/deploy operations. Verify the hose bundle clears all lift and vehicle components. Make adjustments as necessary.



### HYDRAULIC ADJUSTMENTS

#### HOSE BUNDLE ASSEMBLY - LIFT PLATFORM

Hydraulic and electric power is routed to the platform through the lift platform hose bundle.

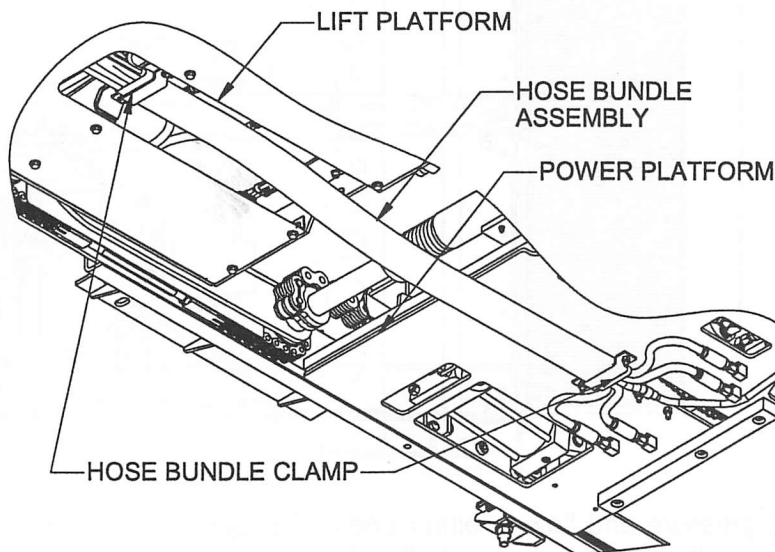


DO NOT PLACE THE LIFT INTO SERVICE IF THE HOSE BUNDLE ASSEMBLY IS DAMAGED OR MAY BE DAMAGED BY OPERATION. A DAMAGED HOSE OR CABLE MAY CAUSE DAMAGE TO THE LIFT, DAMAGE TO THE COACH, AND/OR PASSENGER INJURY.

IF THE HOSE BUNDLE ASSEMBLY IS PINCHED, CRUSHED, OVER-STRESSED, OR OTHERWISE DAMAGED, IT MAY FAIL. DURING INSTALLATION, SERVICING, AND BEFORE PLACING THE LIFT IN SERVICE, VERIFY THE HOSE BUNDLE WILL OPERATE FREELY THROUGHOUT THE LIFT CYCLE. PERIODICALLY INSPECT THE HOSES AND ELECTRIC CABLE IN THE HOSE BUNDLE FOR DAMAGE.

#### TO ADJUST THE HOSE BUNDLE ASSEMBLY FROM THE POWER TO LIFT PLATFORM:

Operate the platform through several deploy/raise/lower/stow cycles and observe the hose bundle assembly. The hose bundle should not contact the first step riser in such a way as to stretch, chafe or damage the hoses. The hose bundle should stay clear of the platform tray cover, splash shield and brush plate throughout the lift's range of motion. Perform the following procedures if stretching, chafing or interference occurs.



1. Deploy the platform to stow height.
2. Loosen both clamps attaching the hose bundle to the lift. One clamp is attached to the lift platform the other to the power platform.
3. Tension the hose bundle so the sag at the midpoint of the assembly is between 1" and 2" inches.
4. Cycle the lift platform to coach floor level and observe the clearance of hose bundle assembly with the step riser.
5. Readjust as required.



### HYDRAULIC ADJUSTMENTS

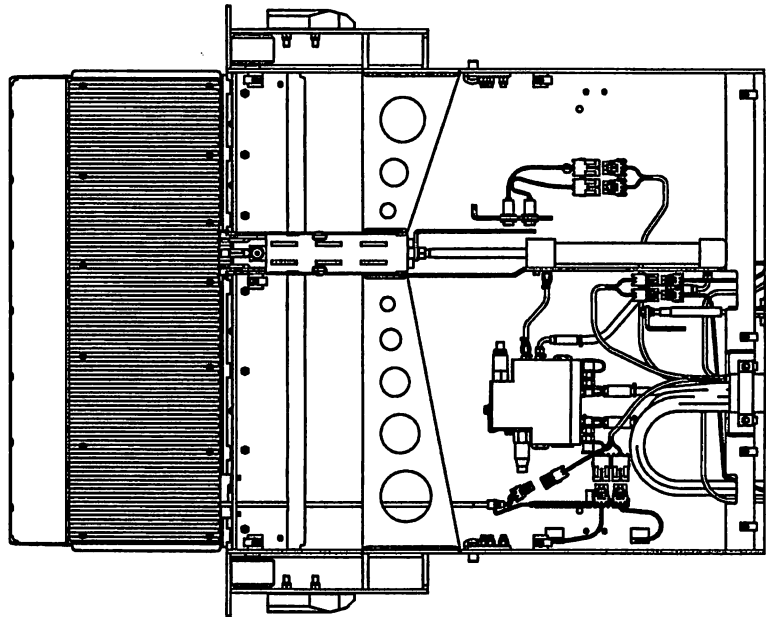
#### CURBSIDE BARRIER RELIEF AND CHECK VALVES

The curbside barrier is equipped with a relief valve on the "curbside barrier down" hydraulic circuit. This barrier relief valve limits the maximum amount of hydraulic pressure available to lower the curbside barrier from the barrier to the ramp position. Consequently, this will prevent or limit the likelihood of the barrier causing damage while lowering to the ramp position.

The curbside barrier relief valve settings are factory preset. No maintenance adjustment and/or service interval is required during normal operation. Location for the curbside barrier relief valve is on the Ramp/Barrier Linkage Manifold Assembly.

The lift hydraulic system also has a relief valve located on the curbside barrier "barrier" hydraulic circuit. Typical location for the relief valve is in the linkage manifold assembly. The relief valve will release fluid pressure to the reservoir only if the hydraulic pressure on the curbside cylinder rod end is greater than the relief valve setting. This will preclude the possibility of damage to the curbside barrier and barrier linkage if a heavy force is applied to the curbside barrier forcing the barrier from the barrier position to the ramp position.

The hydraulic system for the curbside barrier uses two single pilot-operated check valves. These pilot-operated check valves are mounted in the linkage manifold assembly. In this application, the function of the pilot operated check valve is to prevent fluid from both sides of the cylinder from returning to the reservoir unless solenoid "A" or "B" on valve #3 is energized electrically or manually. With fluid trapped in the curbside barrier cylinder by the pilot-operated check valves, the cylinder (and therefore the curbside barrier) cannot move. This prevents the barrier from a "bleed down" condition, as the cylinder is hydraulically bound. Therefore, the barrier remains firmly in position. If either solenoid is energized, pressure and flow to either end of the cylinder is routed to the pilot port on the check valve, this will open the check valve and allow the fluid in the other end of the cylinder to return to the reservoir (tank), allowing the mechanism to form either a barrier or ramp.







### MECHANICAL ADJUSTMENTS

#### GENERAL MECHANICAL ADJUSTMENTS

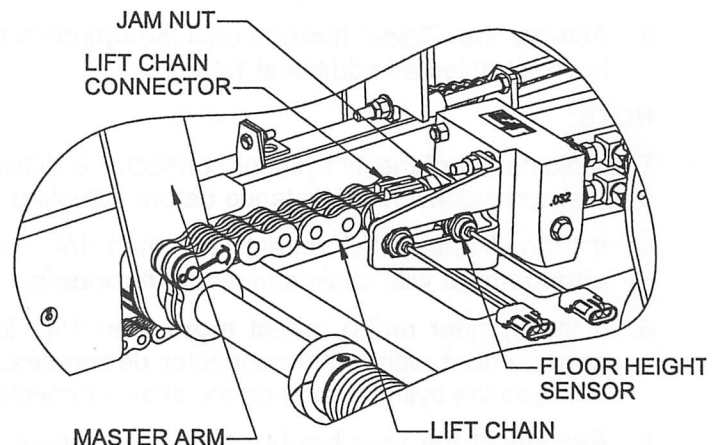
This section contains procedures for the most common mechanical adjustments needed to maintain the lift in optimal operating condition. It is not within the scope of this manual to describe the function of all lift components. It is the responsibility of maintenance personnel to familiarize themselves with the operation of the lift and its components. Maintenance personnel should perform visual inspections on components that are not covered in this section. If a defect is found during a visual inspection, the severity of the defect is to be noted and the appropriate corrections made.

#### LIFT MASTER CHAIN

The lift chain transfers motion from the lift cylinder to the master arms. Rotation of the master arms causes the platform to raise and lower. Adjustment and maintenance of the lift chains are critical to the safe operation of the lift.

The lift chains are properly adjusted when the following two conditions are met.

1. At floor loading position the lift cylinder rods are approximately 1/4" from being fully retracted.
2. At floor level loading position both lift chains have equal tension.



THE LIFT CHAIN CONNECTOR THREADS COULD FAIL IF LESS THAN 1/2" OF THREAD IS ENGAGED INTO THE LIFT CYLINDER ROD. THERE SHOULD BE AT MOST 3/8" OF THREADS EXTENDING PAST THE JAM NUT ON THE REAR LIFT CYLINDER. THERE SHOULD BE AT MOST 9/16" OF THREADS EXTENDING PAST THE JAM NUT ON THE FORWARD LIFT CYLINDER. DURING INSTALLATION, SERVICING, AND BEFORE PLACING THE LIFT IN SERVICE, VERIFY THE LIFT CHAIN CONNECTOR THREADS ARE ENGAGED AT LEAST 1/2" INTO THE LIFT CYLINDER ROD. DO NOT PLACE THE LIFT INTO SERVICE IF THE LIFT CHAIN CONNECTOR IS INADEQUATELY ENGAGED OR DAMAGED. FAILURE OF THE LIFT CHAIN CONNECTOR COULD CAUSE LIFT DAMAGE AND/OR PASSENGER INJURY.





### MECHANICAL ADJUSTMENTS

#### LIFT CHAIN ADJUSTMENT (condition 1)

Before adjusting the lift chain for condition 1, verify the floor height sensor is adjusted properly. The procedure for adjusting the floor height sensor is in the section on sensor adjustment.

1. Raise the platform to floor level loading position and note the position of both lift cylinder rods.
2. Disconnect the floor height sensor.
3. Activate the "Raise" function until the cylinders cannot retract any further. The cylinder rod(s) should have retracted an additional 1/4".

#### NOTE:

The adjustment of the lift cylinder connector is difficult with the cylinder fully retracted. Always extend the cylinder rod a convenient distance before adjusting.

4. If the cylinder rod(s) retract **less** than 1/4", loosen the jam nut and rotate the cylinder rod(s) so **engagement** with chain connector **increases**.
5. If the cylinder rod(s) retract **more** than 1/4", loosen the jam nut and rotate the cylinder rod(s) so **engagement** with chain connector **decreases**. There should always be at least 1/2" engagement between the cylinder rod and the chain connector.
6. Reconnect the floor height sensor and repeat steps 1-5 until the cylinder rod(s) are approximately 1/4" from full retraction when the platform is at floor loading position.

#### LIFT CHAIN ADJUSTMENT (condition 2)

Before adjusting the lift chain for condition 2, adjust the lift chain for condition 1.

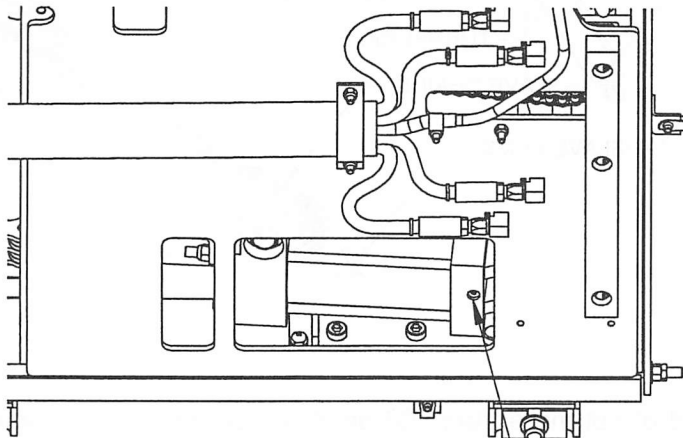
1. Unplug the floor height sensor and activate the "Raise" function until both cylinder rods have fully retracted.
2. See if one of the cylinders is "sagging" due to a lack of tension in the chain.
3. Loosen the jam nut on the cylinder with the loose chain. For ease of adjustment, extend the cylinder rod to a convenient distance.
4. Rotate the cylinder rod so engagement with the chain connector **increases**.
5. Tighten the lift cylinder jam nut.
6. Activate the "Raise" function until both cylinders have fully retracted. Verify both lift chains have equal tension. Repeat steps 2-5 as required.
7. Verify the floor height sensor is adjusted properly.



### MECHANICAL ADJUSTMENTS

#### CUSHION VALVE

The lift cylinder cushion valves slow the lift cylinders by adding hydraulic restriction as the cylinders reach full retraction. The cushion valves are properly adjusted when both lift chains remain taut as the platform is lowered from floor height. Adjustments are made from the underside of the power platform. Before adjusting the cushion valves, verify the lift chain is properly adjusted.



CUSHION VALVE ADJUSTMENT

1. Cycle the lift, the lift platform should slow noticeably as it approaches coach floor level.
2. From floor level loading position select the 'Lower' function. Both lift cylinders should extend at the same speed. If one of the cylinders seems to 'sag' as the platform is being lowered, the cushion valves need to be adjusted.
3. Torque both cushion valves to 5 in/lbs then loosen by 1/8 of a turn.

4. From floor level loading position, select the 'Lower' function. The lift cylinder that 'sags' is the one that is extending too fast.
5. Tighten the cushion valve on the 'fast' cylinder in small increments.
6. Repeat steps 4 & 5 until the lift cylinders extend at the same speed.

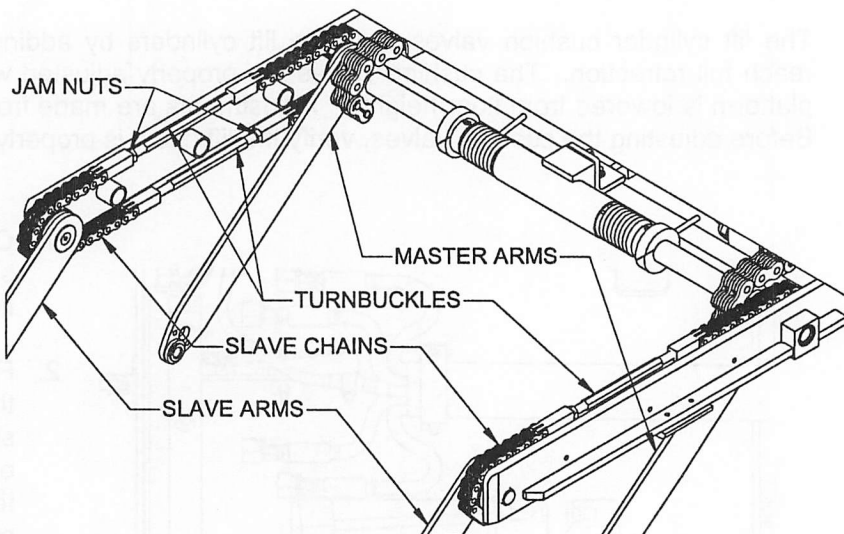


### MECHANICAL ADJUSTMENTS

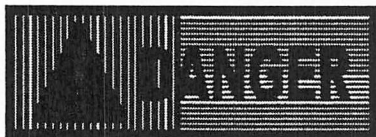
#### SLAVE CHAIN

The slave chains cause the slave arms to move in time with the master arms. This synchronized motion guarantees the platform always remains horizontal.

The slave chains must be adjusted so the master arms and the slave arms remain parallel. If the master arms and slave arm are not parallel, the motion of the platform will not be smooth. When the slave chains are out of adjustment there will be a noticeable "wave" or "buck" in the platform as it passes stow level.



Cycle the lift using an evenly distributed load of not more than 600 pounds. Observe the lift platform's movement. If the motion of the lift platform is smooth as it passes stow level; the slave chains require no adjustment.



**IF OVER TIGHTENED, THE SLAVE CHAINS COULD BIND AS THE OPERATOR TRIES TO LOWER THE PLATFORM FROM COACH FLOOR LEVEL. THE PLATFORM COULD DROP SUDDENLY AND CAUSE SERIOUS INJURY TO A PASSENGER IF THE CHAINS BREAK FREE FROM THEIR BIND.**

**DO NOT STEP ONTO OR STAND IN THE WAY OF THE PLATFORM IF IT STALLS AT COACH FLOOR LEVEL. IF THE CHAINS SHOULD SUDDENLY BREAK FREE, IT COULD CAUSE PASSENGER INJURY.**

**AFTER ADJUSTING THE SLAVE CHAINS AND BEFORE PLACING THE LIFT INTO SERVICE, VERIFY THE UNLOADED PLATFORM WILL PROPERLY CYCLE THROUGH THE RAISE AND LOWER FUNCTIONS WITHOUT BINDING.**



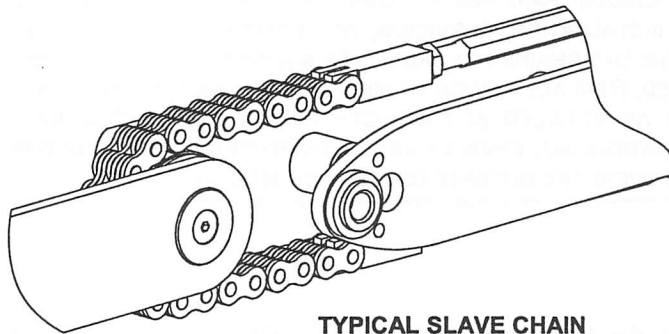
**IF THE SLAVE CHAINS ARE ADJUSTED UNEVENLY, THE PLATFORM COULD "WAVE" OR "BUCK" AS THE PLATFORM PASSES THROUGH STOW LEVEL.**



### MECHANICAL ADJUSTMENTS

#### SLAVE CHAIN

**IF A NOTICEABLE "WAVE" OR "BUCK" IS PRESENT AS THE LIFT PLATFORM PASSES THROUGH STOW LEVEL:**



1. With the bus ride level and the bus on level ground, lower the platform to ground level and remove chain guards.
2. Loosen the turnbuckle jam nuts on both slave chains.
3. Loosen all the turnbuckles until there is noticeable slack in the slave chains. Tighten the upper turnbuckles on both slave chains finger tight. With both turnbuckles equally tight, rotate them an additional 1/2 turn.
4. Place approximately 600 lbs on the platform centered between the trunnions.
5. Raise and lower the platform observing its motion as it lowers through stow level. If the platform motion is not smooth, the upper slave chain turnbuckles need to be tightened. Tighten the upper turnbuckles in 1/6 (one flat) increments until the "wave" or "buck" is not noticed. Typical adjustment is usually no more than 3/4 of a rotation from the finger-tightened position.
6. Once the smoothest possible ride is achieved, remove the 600 lbs and operate the lift through several raise and lower cycles.
7. Lower the platform to ground level and tighten the lower turnbuckle finger tight. With both turnbuckles equally tight, rotate them an additional 1/6 turn.
8. Stow the lift and observe the lift platform guide blocks as they enter the slide channels. The guide blocks should enter close to the same level. If one guide block is lower than the other is as it enters the slide channel, tighten the corresponding upper turnbuckle slightly and loosen the corresponding lower turnbuckle slightly. This will raise the corner of the lift platform.
9. After all adjustments have been completed, tighten the jam-nuts and replace the chain guards.
10. Verify the platform stows at the proper height.



### MECHANICAL ADJUSTMENTS

#### GENERAL CHAIN INSPECTION

Many of the lift's mechanisms are operated by chain. Proper chain maintenance, adjustment, and lubrication is critical to the safe operation of the lift.



LIFT CHAIN FAILURE COULD CAUSE THE LIFT PLATFORM TO DROP TO ITS LOWEST HEIGHT CAUSING SERIOUS PASSENGER INJURY, LIFT DAMAGE, AND/OR COACH DAMAGE. DURING INSTALLATION, SERVICING, AND BEFORE PLACING THE LIFT INTO SERVICE, INSPECT THE LIFT CHAINS TO VERIFY THEY ARE NOT DAMAGED, EXCESSIVELY WORN, OR CORRODED. REPLACE ANY CHAIN (OR PAIRS OF CHAIN) SHOWING SIGNS OF DAMAGE OR WEAR AS DETAILED IN THE INSTRUCTIONS BELOW. FOR SAFE AND RELIABLE LIFT OPERATION, ALL CHAINS MUST BE INSPECTED FOR CHARACTERISTICS OF DAMAGE AND/OR OVERLOAD DURING EACH SERVICE INTERVAL.

#### CHAIN INSPECTION PROCEDURES

All chains used on the LU10 platform lift require the inspection procedure outlined below. Chains that operate in pairs (secondary stow/deploy chains, lift chains and slave chains) must be replaced in pairs.

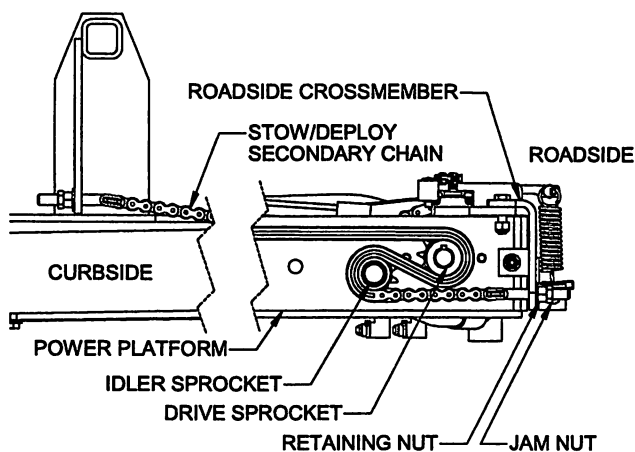
1. Inspect chain link plates for cracks, bending, scuffed edges or elongated pitch holes.
2. Inspect chain pins for rotation or looseness in the link plate holes.
3. Inspect chain rollers. Rollers should turn freely on the bushings.
4. Inspect for spread in the roller link plates.
5. Inspect chain for corrosion. Clean/lubricate as required.



### MECHANICAL ADJUSTMENTS

#### SECONDARY STOW/DEPLOY CHAIN

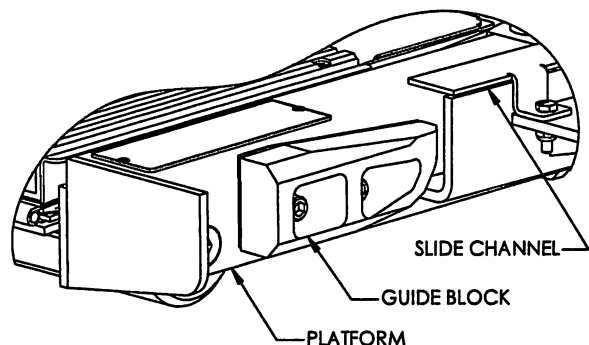
The secondary stow/deploy chain tracks the power platform as it's driven between the stowed and deployed positions. The chain is routed over a drive sprocket and an idler sprocket on the power platform and fastened to the main frame assembly. When tensioning the stow/deploy secondary chain it is important that both chains be tensioned equally. If the tension in one chain is greater than in the other, the power platform may bind within the slide channels.



#### TO ADJUST THE SECONDARY STOW/DEPLOY CHAIN:

Tensioning the secondary stow/deploy chains effect how the platform enters the slide channels. Adjust the chains so the tension in each chain segment is equal.

1. Deploy the lift platform.
2. Loosen the jam-nuts on the roadside chain tensioners.
3. Tension both secondary stow/deploy chains by adjusting the retaining nut. Proper tension will give approximately a 0.75" (3/4") deflection at a point 24 inches curbside of the roadside cross-member.
4. Tighten the jam nuts to 12 ft./Lb.
5. Observe the platform as stows into the slide channels. The lift platform guide blocks should be centered within the slide channels. If the guide blocks enter the slide channels crooked, one of the secondary stow/deploy chains need to be readjusted.
6. If the platform favors the forward slide channel, loosen the rear curbside tensioner and tighten the rear roadside tensioner.







## Section 5

# SERVICE ADJUSTMENT PROCEDURES

7. If the platform favors the rear slide channel, loosen the forward curbside tensioner and tighten the forward roadside tensioner.
8. Deploy and stow the lift, confirming the guide block clearances with the slide channels.
9. Readjust as necessary until the guide blocks are centered within the slide channels.

### DEPLOY STOPS

When the 'Deploy' function is activated the platform will extend from the bus until the deploy stops contact the curbside cross member.



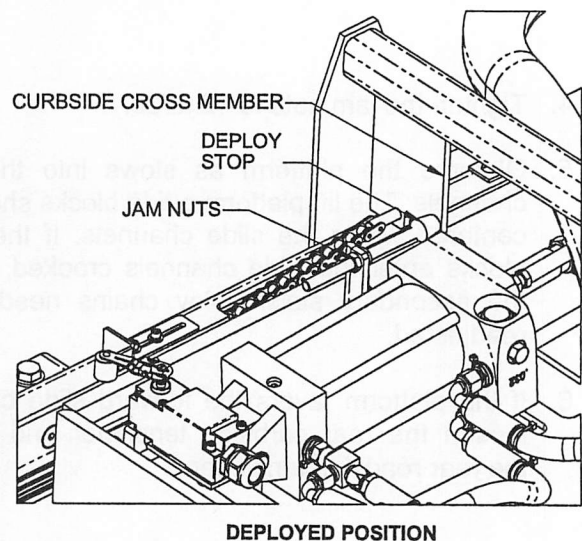
THE LIFT PLATFORM MAY COLLIDE WITH THE STEPWELL RISER, HANDRAILS, OR STANCHIONS, IF THE PLATFORM IS NOT DEPLOYED THE CORRECT DISTANCE. THIS MAY CAUSE DAMAGE TO THE LIFT AND/OR THE COACH.

DURING INSTALLATION, SERVICING, AND BEFORE PLACING THE LIFT IN SERVICE, ALWAYS CONFIRM THE PLATFORM WILL CLEAR THE STEPWELL RISER, HANDRAILS, AND STANCHIONS. CHECK THIS CLEARANCE AFTER ADJUSTING THE DEPLOY STOPS OR THE DEPLOY LIMIT SWITCH. DO NOT PLACE THE LIFT INTO SERVICE UNTIL THE CLEARANCE IS ADEQUATE AND THE ADJUSTMENTS ARE WITHIN SPECIFICATION.

The deploy stops must be positioned so the platform achieves its proper deploy distance. Furthermore, both deploy stops should contact the curbside cross member at the same time. Verify the stow/deploy secondary chains are adjusted properly before adjusting the deploy stops.

### TO ADJUST THE DEPLOY STOPS:

1. Deploy the platform and verify the deploy stop is against the curbside cross member.
2. Measure the distance between the most curbside edge of the platform and the end of the slide channel. This distance is referred to as the 'deploy distance'
3. Compare the measured distance with the deploy distance listed on the specification page.
4. Loosen the jam nuts and adjust the deploy stops until the platform achieves the correct deploy distance. The deploy stops should contact the curbside cross member at the same time.
5. Adjust the stowed/deployed limit switch trip bracket as required. See the procedure in the sensor adjustment section.





### MECHANICAL ADJUSTMENTS

#### PRIMARY STOW / DEPLOY CHAIN

The primary stow/deploy chain causes the stow shaft to be driven by the stow motor. Attached to both ends of the stow shaft is a sprocket that engages the secondary stow/deploy chains.

Two conditions must be checked to verify the primary stow/deploy chain is adjusted properly.

1. Both sprockets must be aligned.
2. If you push on the chain in the center of the span, it should not deflect more than 1/2".

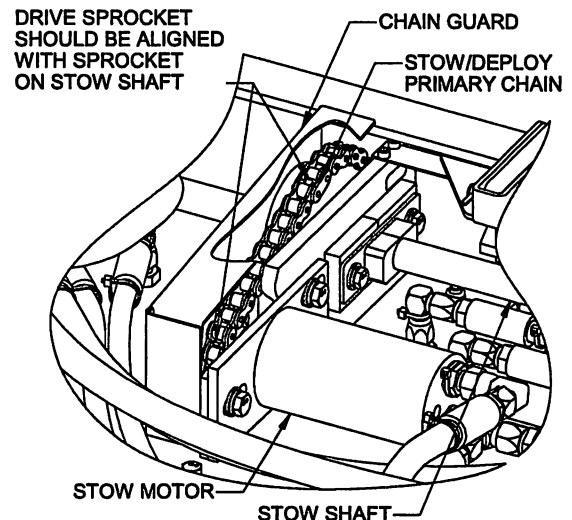
Both conditions can be checked from underneath the power platform after the splash pans are removed.

#### TO ADJUST THE PRIMARY STOW/DEPLOY CHAIN:

1. Remove the chain guard.
2. If the sprockets are misaligned, loosen the setscrew on the larger sprocket and slide it along the stow shaft until it is aligned with the drive sprocket.

#### IF THE CHAIN DEFLECTS MORE THAN 1/2"

3. Loosen the three stow motor mounting bolts.
4. Position the stow motor until the primary stow/deploy chain can deflect no more than 1/2".
5. Tighten the three stow motor mounting bolts.
6. Replace the chain guard and the splash pans.
7. Operate the lift through several stow/deploy cycles, and confirm the tension and alignment of the primary stow/deploy chain.





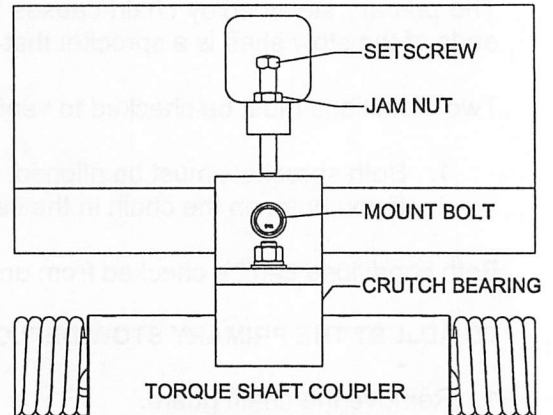
### MECHANICAL ADJUSTMENTS

#### CRUTCH ASSEMBLY

The purpose of the crutch assembly is to prevent deflection in a roadside direction of the torque shaft. Maximum deflection occurs with lift platform loaded and the lift mechanism cycling toward coach floor height. An improperly adjusted crutch assembly may cause the lift to raise and lower unevenly, and/or bind at any level.

##### TO ADJUST THE CRUTCH ASSEMBLY:

1. Lower the platform to ground level. Verify both lift chains are slack.
2. Loosen the jam nut on the setscrew, and loosen the mount bolt.
3. Adjust tensioner bolt so the crutch bearing contacts and aligns with the torque shaft coupler. Do not put a preload on the torque shaft coupler by over tightening the setscrew.
4. Secure the mount bolt and setscrew jam nut.
5. Cycle the platform from ground to coach floor level. If any binding occurs, repeat steps 2 through 5.

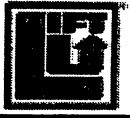


#### OUTER BARRIER LINKAGE ADJUSTMENT

Adjustment of the outer barrier linkage will change the angle between the deployed outer barrier and the platform. After adjusting the outer barrier linkage, the outer barrier sensors must be readjusted. See the section on sensor adjustment.



IF THE OUTER BARRIER ANGLE IS NOT WITHIN SPECIFICATIONS, A PASSENGER COULD FALL FROM THE PLATFORM AND RECEIVE SERIOUS OR FATAL INJURIES. BEFORE PLACING THE LIFT IN SERVICE, THE OUTER BARRIER ANGLE SHOULD BE ADJUSTED WITHIN SPECIFICATION AND THE OUTER BARRIER LINKAGE SHOULD BE INSPECTED FOR DAMAGE.



### MECHANICAL ADJUSTMENTS

#### OUTER BARRIER LINKAGE ADJUSTMENT

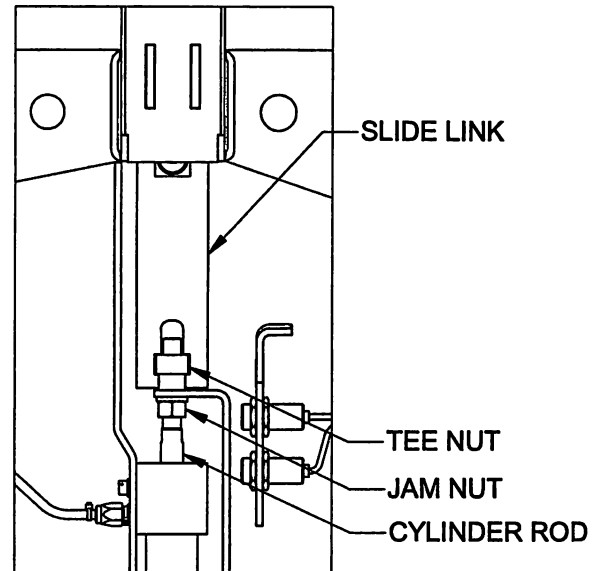
In the step position, unacceptable vibration of the outer barrier may occur if it is not tight against the sidebars.

1. Move the outer barrier into the step position by *fully* retracting the outer barrier cylinder.
2. Grab the outer barrier and attempt to shake it. If it feels loose, the linkage must be adjusted.

The adjustment described below reduces the outer barrier's range of motion. Unnecessary adjustment may not allow the outer barrier to achieve the ramp position.

#### TO ADJUST THE OUTER BARRIER LINKAGE:

1. Remove platform tray cover.
2. Loosen the jam nut.
3. With the curbside barrier cylinder fully retracted, turn the threaded rod so the slide link is drawn toward the cylinder.
4. Continue turning the cylinder rod until the outer barrier is tight against the sidebars. Do not tighten more than necessary.
5. Tighten the jam nut.
6. Adjust the curbside barrier sensors. See the section on sensor adjustment.
7. Replace the tray covers.

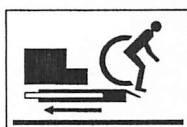
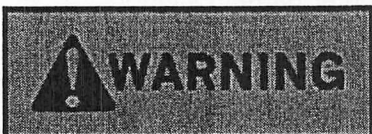




### MECHANICAL ADJUSTMENTS

#### INNER BARRIER LINKAGE ADJUSTMENT

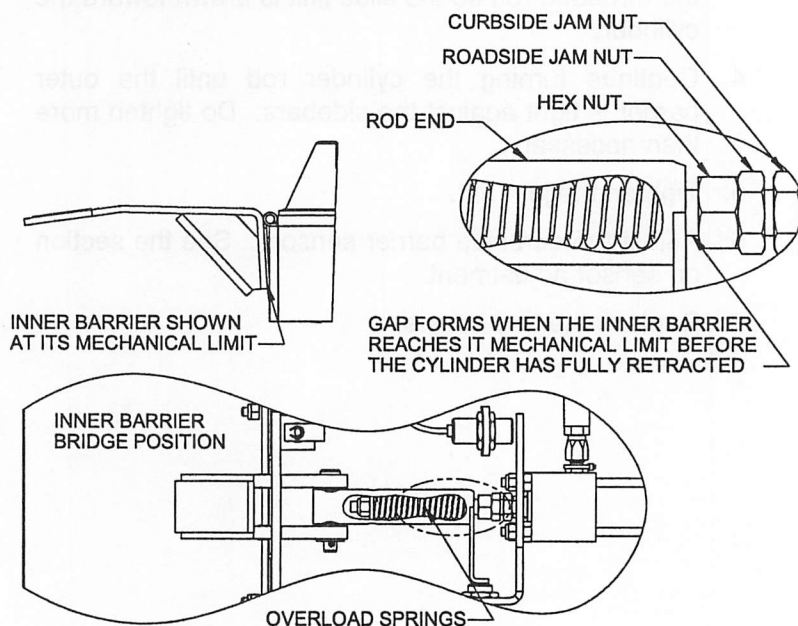
The deployed angle of the inner barrier is set by adjusting the inner barrier linkage.



IF THE INNER BARRIER ANGLE IS NOT WITHIN SPECIFICATIONS, A PASSENGER COULD FALL FROM THE PLATFORM AND RECEIVE SERIOUS OR FATAL INJURIES. BEFORE PLACING THE LIFT IN SERVICE, THE INNER BARRIER ANGLE SHOULD BE ADJUSTED WITHIN SPECIFICATION AND THE INNER BARRIER LINKAGE SHOULD BE INSPECTED FOR DAMAGE.

#### TO VERIFY THE INNER BARRIER LINKAGE IS ADJUSTED PROPERLY:

1. Position the platform between stow height and coach floor height.
2. Move the inner barrier to bridge position by *fully* retracting the inner barrier cylinder.
3. If a gap forms between the rod end and the hex nut, the inner barrier linkage needs to be adjusted.
4. If the inner barrier does not reach its mechanical limit, the inner barrier linkage needs to be adjusted





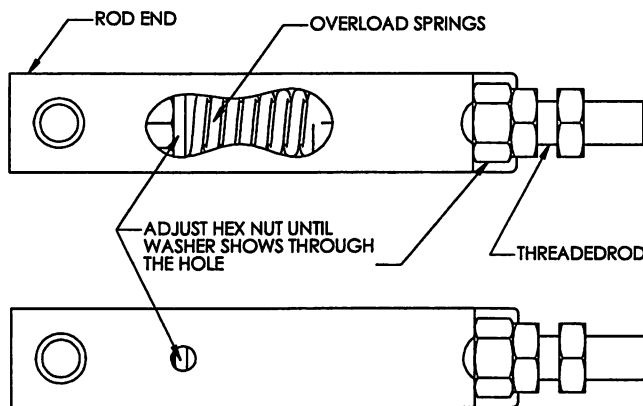
### MECHANICAL ADJUSTMENTS

#### TO ADJUST THE INNER BARRIER LINKAGE:

1. Extend the inner barrier cylinder to convenient length.
2. Loosen the curbside jam nut.
3. If there was a gap between the rod end and the hex nut, turn the cylinder rod so engagement with the threaded rod end decreases.
4. If the inner barrier did not reach its mechanical limit, turn the cylinder rod so engagement with the threaded rod end increases.
5. Cycle the inner barrier to confirm the adjustment. Repeat the adjustment procedure as required.
6. Tighten the curbside jam nut
7. Verify the inner barrier sensors are adjusted properly. See the section on sensor adjustment

When the inner barrier linkage is adjusted according to the above procedure, its deployed angle will be to specification.

#### THE ROD END ASSEMBLY



The hex nut on the rod end assembly should be tightened until the overload springs are slightly compressed. When the washer can be seen through the hole in the rod end, the hex nut is properly adjusted.





LIFT-U®  
Division of  
Hogan Mfg., Inc.

## Section 5

# SERVICE ADJUSTMENT PROCEDURES

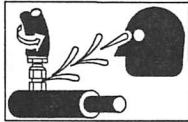
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## Section 6

# HYDRAULIC FLUSHING PROCEDURES



OPENING OR REMOVING ANY HYDRAULIC COMPONENT THAT IS UNDER PRESSURE COULD CAUSE LIFT MOVEMENT AND COULD RELEASE OIL UNDER PRESSURES OF UP TO 2000 PSI. PERSONNEL NEAR THE LIFT COULD BE SPRAYED WITH THE OIL AND/OR INJURED BY THE SUDDEN LIFT MOVEMENT.

BEFORE ATTEMPTING TO OPEN AND/OR REMOVE ANY HYDRAULIC COMPONENT, RELIEVE HYDRAULIC PRESSURE IN THE SYSTEM. BEFORE SERVICING ANY PORTION OF THE LIFT'S RAISE/LOWER HYDRAULIC CIRCUIT, THE LIFT MUST REST FIRMLY ON THE GROUND OR BE SOLIDLY SUPPORTED SUCH THAT THE LIFT WILL NOT MOVE WHEN THE CIRCUIT IS OPENED. DO NOT OPEN ANY HYDRAULIC CIRCUIT WHILE IT IS, OR COULD BE, UNDER PRESSURE. WEAR SAFETY GLASSES WHENEVER SERVICING THE LIFT HYDRAULIC SYSTEMS.

FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY FROM BEING PINCHED/CRUSHED BY THE LIFT UNIT, OIL SPRAYING INTO THE EYES, OIL BURNS, AND/OR IMPACT BY A WHIPPING HYDRAULIC HOSE OR COMPONENT. ANY TIME YOU ARE WORKING ON HYDRAULICS, FLUID LEAKAGE IS POSSIBLE. PREPARE FOR FLUID SPILLAGE PRIOR TO WORKING ON THE HYDRAULIC SYSTEM.



OPENING OR WORKING ON A HYDRAULIC SYSTEM ALLOWS THE POSSIBILITY OF CONTAMINATION. CLEAN WORKING HABITS WILL HELP TO PREVENT CONTAMINATION. CLEAN CONNECTION PRIOR TO DISASSEMBLY. MAKE SURE THE AREA AROUND THE HOSE END (OR HARDLINE) YOU ARE DISCONNECTING IS FREE AND CLEAN FROM LOOSE DEBRIS OR COLLECTED GRIME. MAKE SURE THE DISCONNECTED HOSE END IS NOT ALLOWED TO BE DRUG THROUGH OR DROPPED INTO DIRT. AIR ALSO IS A CONTAMINATE TO THE HYDRAULIC SYSTEM. AT THE CONCLUSION OF THE STEPS LISTED BELOW, TAKE A MOMENT TO BLEED ALL OR MOST OF THE INTRODUCED AIR FROM THE SYSTEM.

### TO BLEED AIR FROM THE SYSTEM

1. Reconnect the hose or hard line.
2. Tighten the connection to just prior to final torqueing and loosen the connection one turn.
3. Have an assistant pump the handpump slowly for the function you are working on.
4. Observe the fluid leaking from the hose or hard line connection.
5. Continue to slowly handpump until clean solid colored fluid is observed leaking from the joint.
6. While the handpump is being pumped, torque the fitting.
7. Discontinue hand pumping when the fitting stops leaking fluid.
8. Use this practice throughout the flushing procedure.



## Section 6

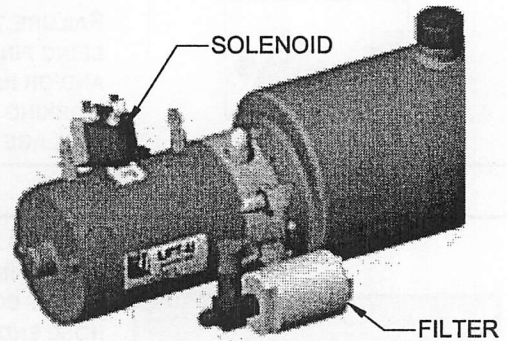
# HYDRAULIC FLUSHING PROCEDURES

### REQUIRED SERVICE EQUIPMENT

1. One waste container. Connect container to the blue (reservoir) return line at the hydraulic power unit end.
2. One waste oil portable container with a section of renewable clear vinyl tubing in the hose assembly so that the mechanic can view the condition of the fluid being flushed.
3. Several –6JIC and –4JIC plugs and caps.
4. A drain hose with a clear section of vinyl tubing connected to two hoses (one size 4 and one size 6). The unused hose should have a plug installed.

### HYDRAULIC POWER UNIT

1. Position the coach on a hoist. Raise the coach 18" off the ground.
2. Turn off coach batteries.
3. Remove the hydraulic power unit from the coach and remove the reservoir.
4. Clean the reservoir and install a new O-ring gasket if required.
5. Replace the pick up filter screen, if contaminated.
6. Drain the hoses.
7. Reassemble hydraulic power unit and replace the pressure filter element.
8. Replace the hydraulic power unit assembly in the coach.
9. Fill the reservoir with clean filtered oil.
10. Connect the Blue hose from the handpump to the port on the power unit. Cap the unused blue (reservoir) port on the control manifold.
11. Reconnect the batteries and monitor the fluid level in the reservoir throughout the balance of this process.
12. **DO NOT** allow the reservoir to run out of fluid.
13. Remove the red pressure port hose (tube) and attach it to waste oil tank.
14. With the lift in the fully stowed position, select "raise" or "lower".
15. Pump the handpump until clean fluid is observed exiting the pressure port.
16. Remove the flushing hoses and refill the reservoir.



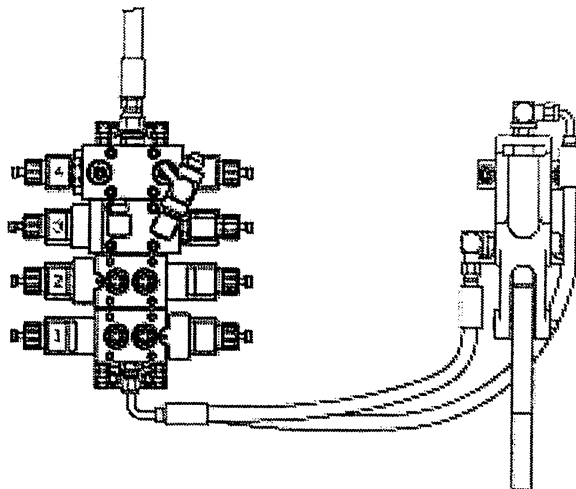
HYDRAULIC POWER UNIT



### HYDRAULIC CONTROL MANIFOLD

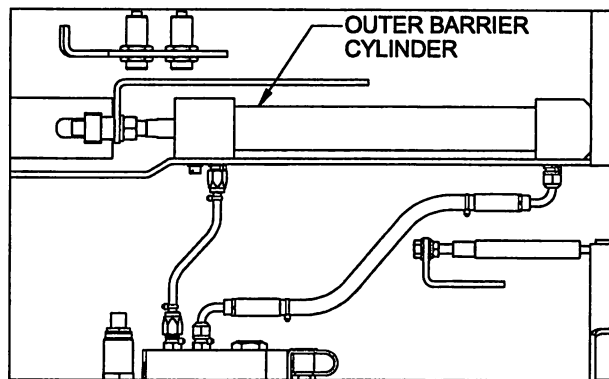
The manifold includes the stow/deploy, raise/lower, bridge up/bridge down, and the ramp up/ramp down circuits. It is mounted on the control/junction box assembly.

1. Deploy and fully extend the lift platform and remove all covers.
2. Raise the lift platform to the floor level.
3. With the inner barrier in the raised position, raise the lift using the handpump. This will cause the lift cylinders to fully retract.



### RAMP / BARRIER CYLINDER

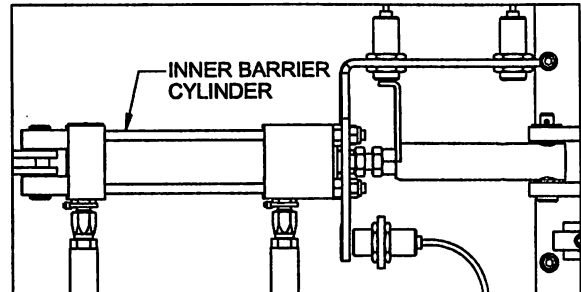
1. Deploy and position the lift platform to work under it safely. Support the lift platform.
2. With the ramp/barrier in the step position, disconnect the hose from the cap end of the cylinder.
3. Connect the waste oil container to the hose normally connected to the cap end of the cylinder.
4. Push on the manual actuator to cause the barrier to extend to the ramp position.
5. Using the maintenance controller, pulse the lower control switch (count "one-thousand-one" to allow a one second pause between pulses!!) until clean fluid is flowing through the hose.
6. Disconnect the waste oil container and reconnect the cap end hose to the ramp/barrier cylinder.
7. Handpump the barrier to the ramp position.
8. Disconnect the hard line connected to the rod end of the barrier cylinder.
9. Connect the waste oil container to the hard line normally connected to the rod end of the ramp/barrier cylinder.
10. Actuate the manual actuator to retract the ramp/barrier to the step position.
11. Using the Maintenance controller, pulse the lower control switch until clean fluid is flowing through the hose.
12. Disconnect the waste oil container and reconnect the cap end hose to the cylinder.





### BRIDGE / BARRIER CYLINDER

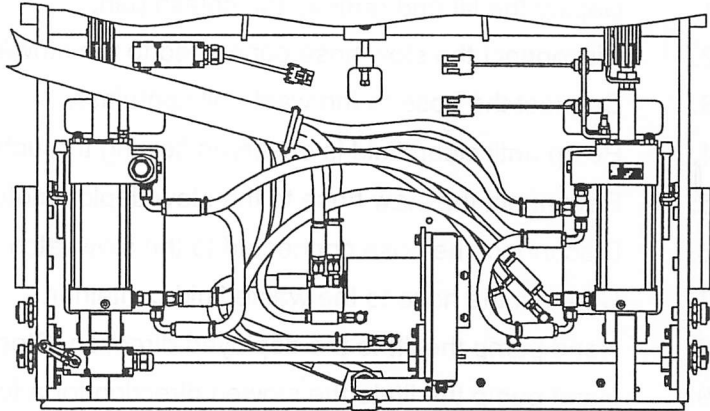
1. Deploy and position the lift platform to work under it safely. Support the lift platform.
2. With the bridge/barrier in the barrier position, disconnect the hose from the rod end of the cylinder.
3. Connect the waste oil container to the rod end hose.
4. Manually actuate the bridge actuator.
5. Using the maintenance controller, pulse the lower control switch until clean fluid is flowing through the rod end hose.
6. Disconnect the waste oil container and reconnect the rod end hose to the bridge/barrier cylinder.
7. Lower the barrier to the bridge position.
8. With the bridge/barrier in the bridge position, disconnect the hose from the cap end of the cylinder.
9. Connect the waste oil container to the hose normally connected to the cylinder.
10. Pump the hand pump to raise the bridge/barrier. This action expels fluid from the barrier hose.
11. Disconnect the waste oil container and reconnect the cap end hose to the cylinder.
12. Raise the bridge/barrier to the barrier position.





### RAISE / LOWER CYLINDERS

1. Deploy and fully extend the lift platform and remove all covers.
2. Raise the lift platform to the floor level. Position the lift platform to work under it safely. Support the lift platform
3. Disconnect the hoses attached to the cap end of the lift cylinders.
4. Drain the pilot lines and hoses.
5. Connect the hose furthest away from the manifold to the waste oil container. Plug the unused hose end.
6. Pump the handpump until clean fluid is observed.
7. Reconnect the hoses.
8. With the lift platform supported, disconnect the hoses at the rod end of each lift cylinder and cap one cylinder fitting.
9. Connect the hose to the other lift cylinder.
10. Supporting the lift cylinder such that the rod end does not run into anything, handpump the lift controls in the lower direction. This will cause the fluid to be expelled from the rod end of the cylinder into the waste oil container.
11. When the cylinder is fully extended, switch the cap and hose.
12. Support the retracted cylinder and hand pump it to reach it's end of stroke.
13. Cap the lift cylinder fittings.
14. Connect the rod end hose furthest away from the manifold to the waste oil container. Hand pump until clean oil is observed.
15. Reconnect the hoses.
16. Hand pump the lift to raise until both lift cylinders start to retract. Carefully and slowly lower the lift platform until the lift cylinders are supporting the lift platform.

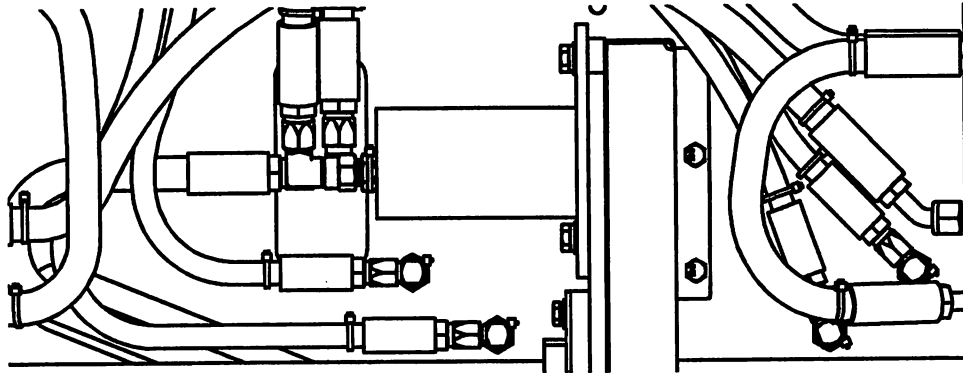






### STOW / DEPLOY MOTOR

1. Deploy the lift and remove the splash pan.
2. Disconnect the stow hose connected to the stow/deploy motor.
3. Connect the hose to the waste oil container.
4. Pump until clean fluid is observed flowing through the hose.
5. Reconnect the stow hose to the stow/deploy motor.
6. Disconnect the hose connected to the stow latch cylinder.
7. Connect the hose to the waste fluid container.
8. Hand pump the lift to the deployed direction. Stop when clean fluid is observed.
9. Hand pump the lift to the stowed direction for a few inches until clean fluid is observed.
10. Reconnect the hose to the stow latch cylinder.





### LIFT REMOVAL PROCEDURE

#### LIFT REMOVAL PROCEDURE

The lift unit is designed for easy removal and installation in the event of an accident severe enough to do structural damage to the lift. However, reinstallation requires the use of shims or slotted brackets to accurately align lift mechanism within the bus structure. Consult specifications, bus manufacturer, and LIFT-U® service personnel for installation information.



THE LIFT ASSEMBLY PACKAGE WEIGHS APPROXIMATELY 1000 POUNDS AND IS AWKWARD TO MANIPULATE OR LIFT. IF THE LIFT PACKAGE DROPS, PERSONNEL BENEATH IT COULD BE SERIOUSLY OR FATALLY INJURED AND THE LIFT COULD BE DAMAGED. PERSONNEL COULD ALSO BE INJURED IF THEY ATTEMPT TO MOVE THE LIFT MECHANISM IMPROPERLY.

BEFORE ATTEMPTING TO REMOVE THE LIFT PACKAGE, SECURELY SUPPORT UNIT WITH JACKS THAT ARE SUITABLE FOR THE TOTAL WEIGHT OF THE LIFT PACKAGE. DO NOT MOVE DIRECTLY BENEATH THE LIFT MECHANISM WHILE REMOVAL IS IN PROCESS. WHEN MOVING THE LIFT, USE DEVICES THAT WILL CARRY THE LIFT'S WEIGHT AND NOT REQUIRE THE LIFTING STRENGTH OF PERSONNEL. PERSONNEL COULD BE SERIOUSLY INJURED IF THE LIFT FALLS ONTO THEM. PERSONNEL COULD BE SERIOUSLY INJURED BY IMPROPERLY MOVING OR LIFTING THE LIFT PACKAGE. THE LIFT COULD BE DAMAGED IF DROPPED.

#### TO REMOVE THE LIFT MECHANISM:

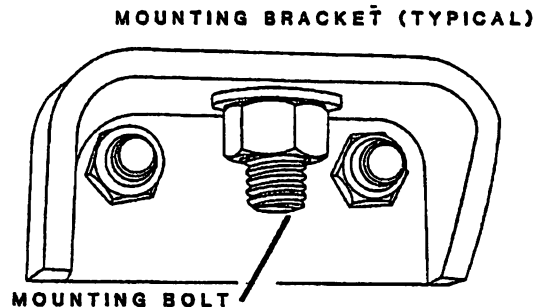
1. Chock the wheels; secure coach by means other than the air system.
2. Remove the splash pan.
3. Disconnect the coach batteries.
4. Disconnect hose/cable assembly from either the power platform or control unit assembly ends. Select whichever is easiest to access. Cap or plug all hydraulic lines.
5. Support the lift mechanism with jacks suitable for the full weight of the lift package. The total weight of the lift package is approximately 1000 pounds.



### LIFT REMOVAL PROCEDURE

#### LIFT REMOVAL PROCEDURE (continued)

6. Remove the mounting bolts that mount the mounting brackets to the bus-side structure. Lower the lift package from the coach, noting and retaining shim packs for each mounting bracket.



The lift is adjusted in a vertical manner by shim packs between lift and bus-side mounting bracket locations. For optimum performance and operation of the lift package and for correct interface between the lift package and the bus-side structure, the lift mechanism must be installed such that the slide channels are level, parallel, evenly centered within the door opening and of a proper distance and tolerance from outside to outside of the slide channels. The lift package is designed to be installed at a specific height relative to the coach floor level. The specifications given in this manual identify the proper distance for this setting. Consult with bus manufacturer for further information on this matter.



### LIFT INSTALLATION PROCEDURE

#### LIFT INSTALLATION PROCEDURE

The procedure that follows is instructions for the typical **LIFT-U®** installation. Certain installations will have different procedures depending on the lift interface with the coach structure. Consult coach manufacturer for additional information and/or procedures specific for certain installations.

#### TO INSTALL LIFT MECHANISM:

1. Support the lift assembly with a forklift or other device suitable for lifting approximately 1000 pounds.
2. Place the lift assembly below the vehicle at the intended location. Raise the lift assembly sufficiently to enable routing of the hose/cable bundle from the lift.
3. Carefully route the hose/cable bundle from the lift to either: a) the bulkhead adjacent to the lift, connecting the bundle's hydraulic lines and electrical cable to the bulkhead, making sure to match the corresponding color codes or; b) directly to the vehicle's curbside compartment. Make sure to allow sufficient free length at the lift end for the bundle to articulate with the deployment and stowage of the lift. Affix the bundle securely to the vehicle chassis.
4. Mount the Power/Control Assembly in the vehicle's curbside compartment using the hardware supplied by LIFT-U®. Apply anti-seize lubricant to screw threads before installing the fasteners. Connect the hose/cable bundle hydraulic lines to the manifold, matching the corresponding color codes. Connect the lift cable to the j-box. Attach the vehicle battery and ground connections to the pump/motor. Make sure the cable from the battery includes a 150 amp fuse or circuit breaker. Connect the vehicle interface cable to the LIFT-U® j-box. Secure all lines to the compartment as needed.



THE USE OF IMPROPER LIFT MOUNTING BOLTS MAY CAUSE THE BOLT TO FAIL, WHICH MAY RESULT IN LIFT OR COACH DAMAGE. WHENEVER SERVICING THE LIFT MECHANISM, VISUALLY INSPECT THE LIFT FOR INSECURE LIFT MOUNTING BOLTS. REPLACE LIFT MOUNTING BOLT IF NECESSARY. WHEN REPLACING LIFT-MOUNTING BOLTS, USE ONLY THOSE SUPPLIED BY LIFT-U. MOUNTING BOLT FAILURE MAY CAUSE LIFT DAMAGE AND MAY CAUSE COACH DAMAGE AND/OR PASSENGER INJURY.

5. Align the lift assembly with the vehicle mounting brackets. Raise the lift assembly into position and attach the lift frame to the vehicle brackets at four (4) points, one at each corner. Do not torque the fasteners just yet. Shim the lift frame elevation as required to achieve the interface dimensions specified on the Lift Operation/Envelope drawing. Note the bolts and shims used to fasten the lift to the vehicle brackets are supplied by LIFT-U®. Apply anti-seize lubricant to screw threads before installing fasteners.



## Section 7

# REMOVAL / INSTALLATION



INSTALL ONLY THE AMOUNT OF SHIMS REQUIRED TO FILL THE SPACE BETWEEN MOUNTING BRACKET AND THE BUS-SIDE STRUCTURE. FAILURE TO SHIM MORE OR LESS THAN THE REQUIRED AMOUNT MAY RESULT IN SLIDE CHANNEL DISTORTION WHEN MOUNTING BOLTS ARE SECURED AT TORQUE SPECIFICATION.

6. Deploy the lift manually. Consult the manual operation procedures. Observe the operation of the lift and check the following clearances with the vehicle before proceeding.
  - a. As the lift extends to the deployed position, the power platform strongarms and chain guards must clear the door panels and their operating arms and/or mechanisms.
  - b. The vehicle step riser shall have 1" minimum vertical clearance from the top of lift platform surface to the bottom edge of fixed step riser for the lift platform to stow and deploy under.
  - c. The vehicle step riser shall have a minimum 1¼" vertical, and 1" horizontal clearance for the lift platform side curbs to stow and deploy through.
  - d. Thoroughly examine the bus structure above the lift for anything that may interfere with the lift's operation (i.e., steering drag link, radius rods, stabilizer bars, jacking posts, bracing, air tanks, etc.).
  - e. The hose/cable bundle shall be routed in such a manner to allow the bundle to articulate freely without interfering with vehicle structure or lift components that may obstruct or inhibit lift operation, or cause the bundle to wear from chaffing. The hose/cable bundle must bend smoothly and be free of kinks.
7. Next, manually operate the lift to the positions noted and adjust the lift mounting as required to meet the following tolerances:
  - a. In the stowed position, the lift first step nosing shall be located relative to vehicle floor nosing per the Lift Operation/Envelope drawing within  $\pm \frac{1}{8}$ " both horizontally and vertically (ref. Figures 4 and 5).
  - b. Lift shall be installed perpendicular to vehicle stepwell floor nosing within  $\pm \frac{1}{8}$ " (ref. Figure 4, dims D1 & D2).
  - c. Lift shall be installed symmetrical about vehicle door centerline within  $\pm \frac{1}{8}$ ", unless otherwise indicated on the Lift Operation/Envelope drawing (ref. Figure 5, dims F1 & F2).
  - d. When the lift is docked at the vehicle floor there shall be no more than ½" gap between the sides of the lift platform/bridge and the stepwell.
  - e. The lift's bridge overlap at the vehicle floor shall be the dimension indicated on the Lift Operation/Envelope drawing. If the specified overlap dimension cannot be achieved, and all other dimensions are within tolerance, including horizontal gaps, the absolute minimum bridge overlap allowable is 1" (ref. Figure 6).



- f. Lift main frame shall be installed parallel with the vehicle floor within  $\pm \frac{1}{8}$ ", unless otherwise indicated on the Lift Operation/Envelope drawing (ref. Figure 3, dims A1 & A2; and Figure 5, dims E1 & E2).
  - g. Lift main frame shall be installed square within  $\pm \frac{1}{8}$ " (ref. Figure 4, dims B1 & B2).
  - h. Lift main frame shall be installed with the forward and rear channels parallel to each other within  $\pm \frac{1}{16}$ " (ref. Figure 4, dims C1 & C2).
  - i. Lift main frame shall be installed such that the forward and rear channels do not exhibit any camber, bow, or twist in excess of  $\pm \frac{1}{16}$ ".
8. Using the shims and bolts supplied by LIFT-U®, shim the remaining lift mounting brackets and install the fasteners. Apply anti-seize lubricant to screw threads before installing the fasteners. Note the lift shall be securely fastened to the vehicle at each mounting point provided on the lift main frame.
  9. Torque the mounting bolt to 64 ft-lbs.
  10. Cycle the lift with the operator control panel switches. Check for proper lift operation and clearances.
  11. Install the lift handrails with the hardware provided (ref. Figure 7). Apply anti-seize lubricant to screw threads before installing fasteners. Torque the handrail bolts to 35 ft-lbs.
  12. Verify the lift handrails in the stowed position do not interfere with the vehicle door as the door articulates between its opened and closed positions.
  13. Deploy the lift. As the lift extends to the deployed position, verify the handrails clear the door panels and their operating arms and/or mechanisms.
  14. Verify the reservoir's hydraulic fluid level is no less than half full and no more than  $\frac{1}{2}$ " from the top of the reservoir. If necessary, add fluid.
  15. Check the hydraulic system pressure. The pressure measured at the D.C. pump/motor must be set at 1250 PSI  $\pm$  25 PSI. Adjust the pressure relief valve if necessary.
  16. Install the splash shields.
  17. Connect the threshold warning sensor to the lift interface cable and secure the cable to the vehicle as needed.

Due to vehicle manufacturing tolerances, each installation will require some lift adjustments. Typically, deployment and floor height adjustments are necessary to optimize the platform position relative to the vehicle floor. For information regarding lift adjustment procedures refer to the LIFT-U® Technical Service Manual.





### LIFT PLATFORM REMOVAL

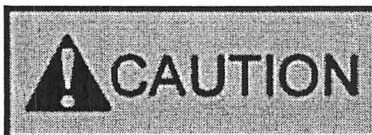
#### LIFT PLATFORM REMOVAL



THE LIFT PLATFORM WEIGHS APPROXIMATELY 200 POUNDS AND IS AWKWARD IN SIZE AND HEAVY TO MANIPULATE. IF THE PLATFORM DROPS, PERSONNEL BENEATH IT COULD BE SERIOUSLY INJURED AND THE LIFT COULD BE DAMAGED. PERSONNEL COULD BE INJURED IF THEY ATTEMPT TO MOVE THE LIFT PLATFORM IMPROPERLY.



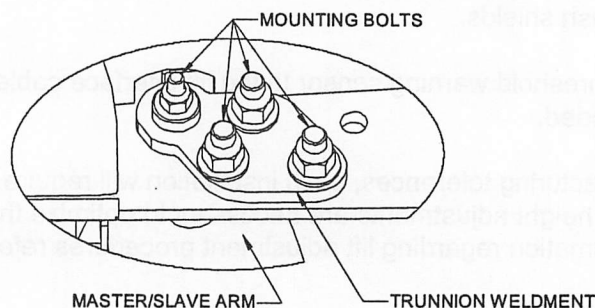
BEFORE ATTEMPTING TO REMOVE THE LIFT PLATFORM, SECURELY SUPPORT THE PLATFORM WITH JACKS (OR A CART) THAT ARE SUITABLE FOR THE TOTAL WEIGHT OF THE PLATFORM. DO NOT PLACE YOUR BODY OR LIMBS DIRECTLY BENEATH THE PLATFORM WHILE IN THE PROCESS OF REMOVING THE PLATFORM. WHEN MOVING THE LIFT PLATFORM, USE CORRECT LIFTING TECHNIQUES.

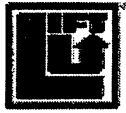


THE MASTER ARMS, SLAVE ARMS, TRUNNIONS, AND/OR BUSHINGS MAY BE DAMAGED BY AN ATTEMPT TO PRY OR BEND THE ARMS WHEN REMOVING THE PLATFORM FROM THE TRUNNIONS. DO NOT PRY OR BEND THE MASTER OR SLAVE ARMS WHEN REMOVING THE PLATFORM. IF ANY MASTER OR SLAVE ARMS ARE BENT OR DAMAGED WHILE REMOVING THE LIFT, THEY SHOULD BE REPLACED BEFORE RETURNING THE LIFT TO SERVICE. ARMS THAT ARE DAMAGED BY PRYING OR BENDING MAY COMPROMISE LIFT SAFETY AND REQUIRE REPLACEMENT. IF NOT REPLACED AFTER BEING BENT, THE ARMS MAY FAIL WHILE IN SERVICE.

#### TO REMOVE THE LIFT PLATFORM:

1. Deploy the lift mechanism; raise the lift platform to the coach floor level.
2. Remove the tray cover.
3. Disconnect and cap the hydraulic lines and the electrical cable on the hose/cable bundle from the power platform to lift platform. If convenient, do this at the power platform end of the bundle.
4. Back off the turnbuckles on both top and bottom of each slave chain assembly several complete rotations of the turnbuckle.

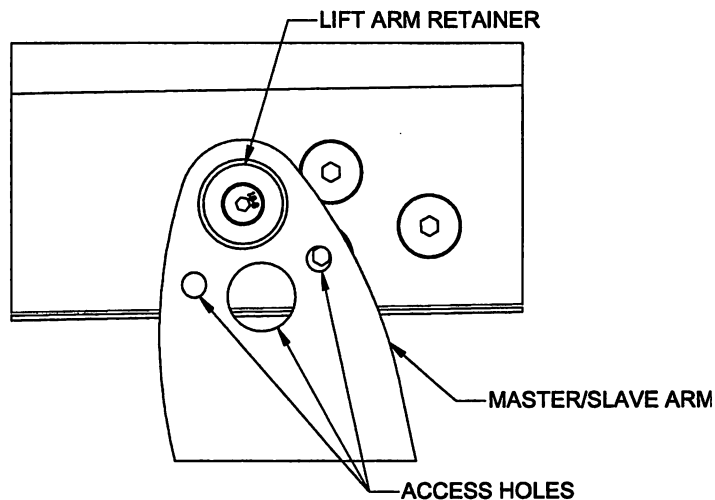




### LIFT PLATFORM REMOVAL

#### LIFT PLATFORM REMOVAL (continued)

5. Support the lift platform with a forklift or other suitable jacks. The total weight of the lift platform is approximately 200 pounds.
6. Remove the trunnion retaining bolts on the four lift platform trunnions. Remove the lift platform trunnions.
7. Shift the lift platform side to side to remove the platform from the master and slave arms.
8. Once the platform is free of the master and slave arm weldments, remove the lift platform.





### LIFT PLATFORM INSTALLATION

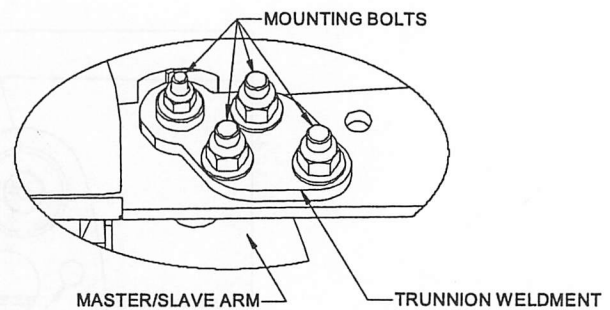
#### LIFT PLATFORM INSTALLATION



THE MASTER ARMS, SLAVE ARMS, TRUNNIONS, AND/OR BUSHINGS MAY BE DAMAGED BY AN ATTEMPT TO PRY OR BEND THE ARMS WHEN INSTALLING THE PLATFORM ONTO THE TRUNNIONS. DO NOT PRY OR BEND THE MASTER OR SLAVE ARMS WHEN INSTALLING THE LIFT PLATFORM. IF ANY MASTER OR SLAVE ARMS ARE BENT OR DAMAGED WHILE INSTALLING THE LIFT PLATFORM, THE ARMS SHOULD BE REPLACED BEFORE RETURNING THE LIFT TO SERVICE. MASTER OR SLAVE ARMS THAT ARE DAMAGED BY PRYING OR BENDING MAY COMPROMISE LIFT SAFETY AND REQUIRE REPLACEMENT. IF NOT REPLACED AFTER BEING BENT, THE MASTER OR SLAVE ARMS MAY FAIL WHILE IN SERVICE CAUSING PASSENGER INJURY.

#### TO INSTALL LIFT PLATFORM:

1. Raise the lift master and slave arms raised to near coach floor level.
2. Loosely mount the four (4) trunnion weldments to the lift platform.
3. Lower the lift platform to the slave and master arms. Align the master and slave arms on the trunnions.
4. Secure the master and slave arm retaining bolts to the trunnions.
5. Lower the lift platform to approximate stow level or the point at which both master and slave arms are near horizontal. Refer to manual operating procedure.
6. Torque the mounting bolts on each of the four (4) trunnion weldments. There may not be enough clearance to get access to roadside trunnion mounting bolt, as slave and master arm may cover bolt head. However, an access hole has been provided on each master and slave arm to facilitate trunnion mounting.
7. Tension the top turnbuckles on both slave chain assemblies to the point at which the turnbuckles are finger tight. This will provide a preliminary adjustment point for slave chain tension.
8. Adjust slave chains per previously noted procedure.





### LIFT PLATFORM INSTALLATION

#### LIFT PLATFORM INSTALLATION (continued)



IF THE LIFT PLATFORM TRUNNION WELDMENTS ARE NOT ALIGNED WHEN THE MASTER AND SLAVE ARMS ARE HORIZONTAL OR THE SLAVE CHAINS ARE NOT PROPERLY ADJUSTED. THE LIFT PLATFORM MAY "BUCK" WHEN PASSING THROUGH STOW LEVEL.

WHEN INSTALLING LIFT PLATFORM AND/OR ADJUSTING THE TRUNNION WELDMENTS, THE TRUNNIONS MOUNTING BOLTS MUST BE SECURED WHEN THE MASTER AND SLAVE ARMS ARE HORIZONTAL. AFTER INSTALLATION OF THE LIFT PLATFORM TRUNNIONS, THE SLAVE CHAINS MUST BE CHECKED FOR CORRECT TENSION AND ADJUSTMENT. CYCLE THE LIFT MECHANISM THROUGH THE RANGE OF MOTION FOLLOWING INSTALLATION TO VERIFY SMOOTH AND CORRECT OPERATION OF THE LIFT. DO NOT PUT THE LIFT INTO SERVICE IF THE TRUNNIONS, SLAVE CHAINS, OR THE PLATFORM BARRIERS ARE MIS-ALIGNED.

9. Reconnect the lift platform hose/cable assembly.
10. Adjust the roadside and curbside barriers as required.
11. Replace lift platform tray cover.

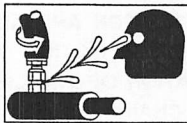


### LIFT CYLINDER REMOVAL

#### LIFT CYLINDER REMOVAL



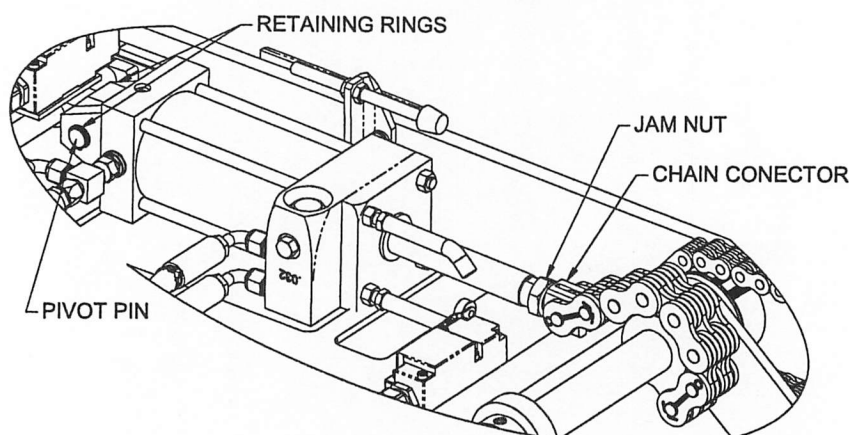
OPENING OR REMOVING THE LIFT CYLINDER WHILE IT IS UNDER PRESSURE COULD CAUSE LIFT PLATFORM MOVEMENT AND COULD RELEASE OIL UNDER PRESSURES OF UP TO 2000 PSI. PERSONNEL NEAR THE LIFT COULD BE SPRAYED WITH THE OIL AND/OR CRUSHED BY THE MOVING LIFT.



RELIEVE HYDRAULIC PRESSURE IN THE SYSTEM BEFORE ATTEMPTING TO OPEN AND/OR REMOVE ANY CYLINDER. BEFORE SERVICING THE LIFT CYLINDER HYDRAULIC CIRCUIT, THE LIFT PLATFORM MUST REST FIRMLY ON THE GROUND OR BE SOLIDLY SUPPORTED BY JACKS THAT ARE SUITABLE FOR THE TOTAL WEIGHT OF THE LIFT PLATFORM. BE SURE THE TENSION HAS BEEN RELIEVED FROM THE LIFT CYLINDER MASTER CHAINS BEFORE ATTEMPTING TO REMOVE THE LIFT CYLINDERS. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS OR FATAL INJURY FROM BEING PINCHED/CRUSHED BY THE LIFT PLATFORM, OIL SPRAYING INTO THE EYES OR BODY, OIL BURNS, AND/OR IMPACT BY A WHIPPING HYDRAULIC HOSE.

#### TO REMOVE A LIFT CYLINDER:

1. Deploy and lower the lift platform to ground floor level.
2. Remove the splash pan.
3. Disconnect and cap the two hydraulic hoses going to each of the lift cylinders.

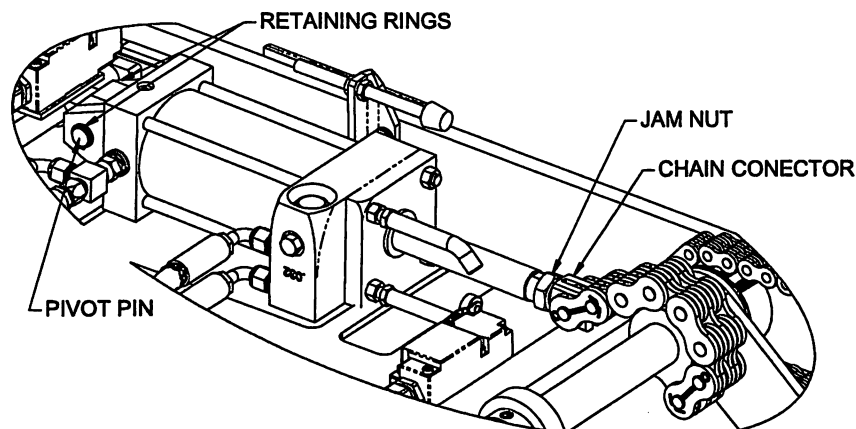




### LIFT CYLINDER REMOVAL

#### LIFT CYLINDER REMOVAL (continued)

4. Loosen the jam nuts on the lift chain connectors. A flat has been provided on the lift cylinder shaft to allow the shaft to be held while the jam-nut is loosened.
5. Remove the retaining rings on the lift cylinder pivot pins.
6. Remove the lift cylinder pivot pins.
7. Raise the roadside end of the lift cylinder and unthread the cylinder from the lift chain turnbuckle bolt. If this is not possible, rotate the cylinder rod shaft and unthread it from the lift turnbuckle without rotating the lift cylinder.
8. Remove lift cylinder.







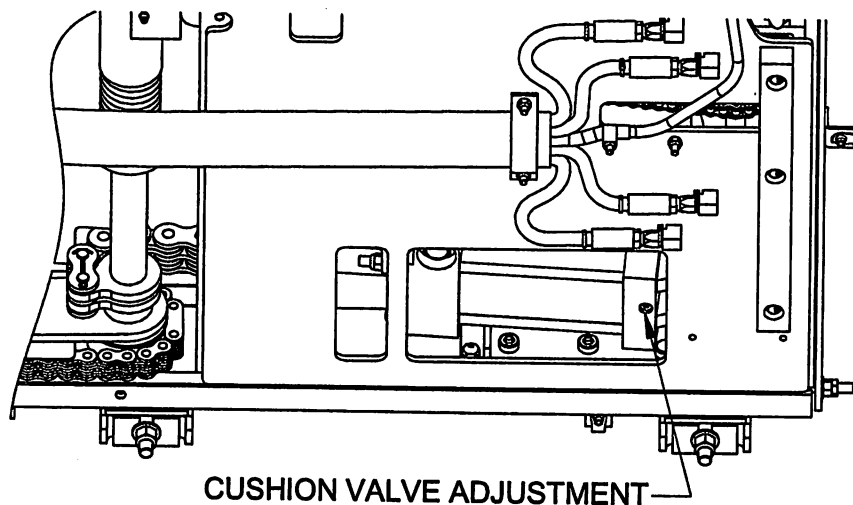
### LIFT CYLINDER INSTALLATION

#### LIFT CYLINDER INSTALLATION

**NOTE:** Be sure that the upper cushion valve on the replacement lift cylinder is fully bottomed out, at 5 in/lb. of torque, as all cushion valve adjustments are made with the lower cushion valve alone. Failure to close upper cushion valve will result in difficulty making correct cushion valve settings.

#### TO INSTALL LIFT CYLINDER:

1. Lubricate pivot pin with quality anti-seize or assembly lube.
2. Align lift cylinder with mount bore. Install lift cylinder pivot pin. Install retaining ring.
3. Thread the lift cylinder shaft on lift chain turnbuckle bolts by rotating the lift cylinder shaft.
4. Adjust lift cylinders, cushion valves and set coach floor proximity switch.
5. Cycle the lift mechanism; confirm all adjustments and settings.
6. Secure lift cylinder jam-nuts.

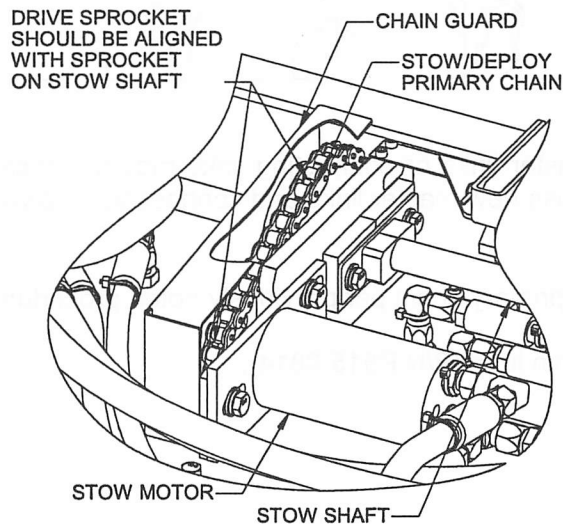




### STOW/DEPLOY PRIMARY CHAIN REMOVAL

#### TO REMOVE THE STOW/DEPLOY PRIMARY CHAIN:

1. Deploy the lift platform. If the chain is broken or jammed, it may be possible to pull the lift platform out to the fully deployed position. If not, the stow/deploy secondary chains need to be removed prior to attempting to pull the lift platform curbside.
2. Remove the splash pan.
3. Remove the drive chain guard.
4. Locate and remove the primary chain master link. Remove stow/deploy primary chain.
5. Inspect the motor and shaft sprockets for wear, damage, and/or misalignment between motor sprocket and the stow shaft sprocket.



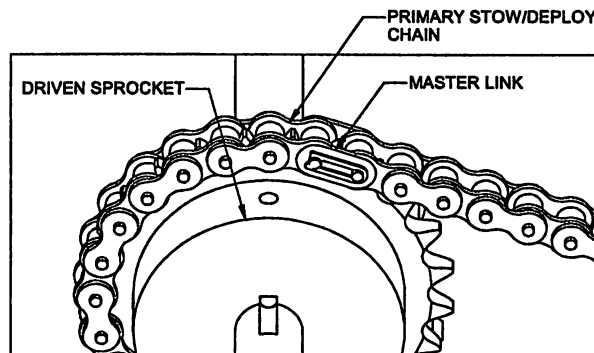
**NOTE:** Minor or local damage to the sprockets can be dressed with a fine file. However, if visible wear and/or peening are present, the sprocket(s) should be replaced. If sprockets are replaced, confirm the alignment between the motor sprocket and the shaft sprocket prior to placing lift in service.



### STOW/DEPLOY PRIMARY CHAIN INSTALLATION

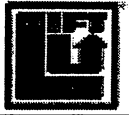
#### TO INSTALL STOW/DEPLOY PRIMARY CHAIN:

1. Loosen the three bolts attaching the motor bracket to the power platform. Slide the stow/deploy motor as far roadside as adjustment will allow.
2. Install the new stow/deploy primary chain segment and master link.



**NOTE:** Reused chain master links or connecting links may fail because of damage during removal process. Always use new master links and connecting links when joining chain segments.

3. Tension the stow/deploy primary chain per previously noted procedures.
4. Lubricate with special chain lube (P/N P515-0014).

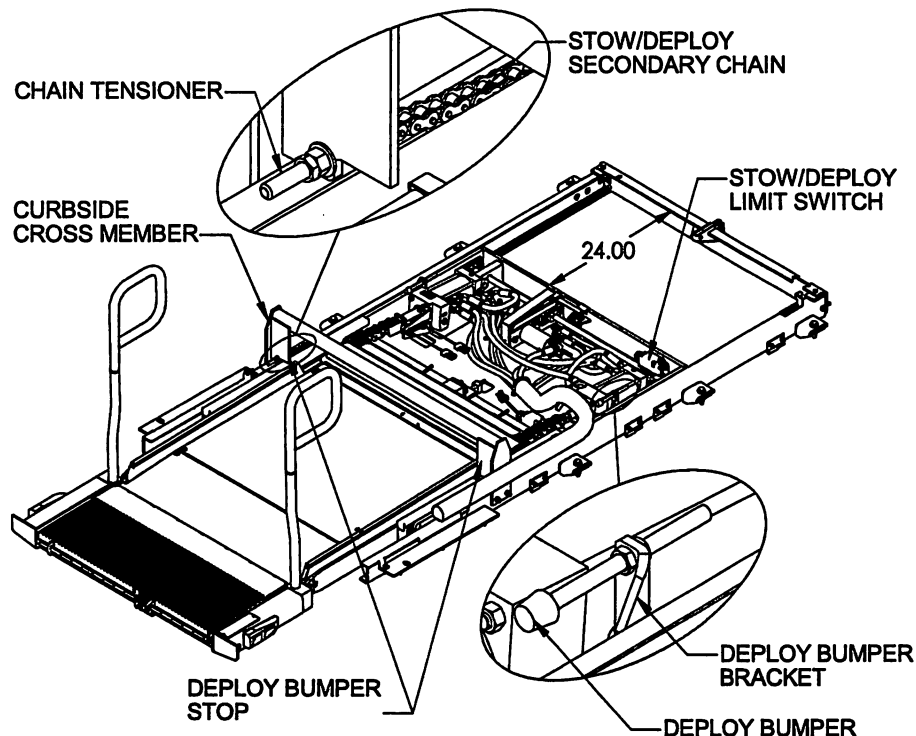


### SECONDARY STOW/DEPLOY CHAIN REMOVAL

**NOTE:** The following procedure is outlined with assumption that the lift mechanism will be moved in a curbside direction to gain access to the stow/deploy idler and sprocket assemblies. However in some installations, the lift mechanism can be moved in a roadside direction to gain the same access. In most cases, if roadside access can be achieved, this process is preferred. The procedure is the same as noted but the handrail assemblies may need to be removed to allow roadside access.

#### TO REMOVE THE SECONDARY STOW/DEPLOY CHAINS (removal for a curbside direction only):

1. Deploy the lift approximately 24 inches. If secondary stow/deploy chains are jammed or broken, the lift may be moved in a curbside direction if the secondary stow/deploy chain tensioners are removed on both the roadside and curbside cross-members.
2. Remove splash shield.
3. Disconnect roadside and curbside chain tensioners.
4. Remove the power platform hose/cable bundle from forward slide channel mounting bracket.





### STOW/DEPLOY SECONDARY CHAIN REMOVAL (continued)

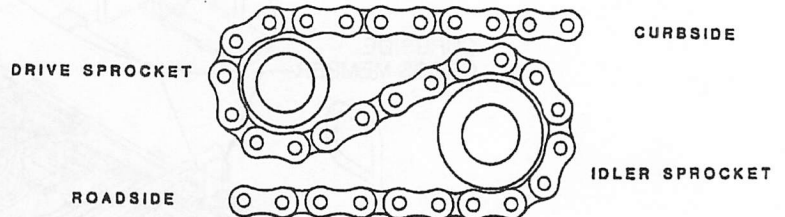
5. If possible, remove the step riser and first step to gain access to the curbside cross-member. Consult bus manufacturer for procedures.
6. Remove the curbside bumper stops and bumper stop brackets.
7. Remove slide channel close-outs (if applicable).
8. Remove stow/deploy switch assembly from the mounting pad. Place the switch assembly out of the way by either removing the switch or laying the switch on the power platform. This will allow the platform to be pulled in a curbside direction without obstruction.



THE LIFT ASSEMBLY PACKAGE WEIGHS PROXIMATELY 1000 POUNDS AND IS AN AWKWARD WEIGHT TO MANIPULATE. IF THE LIFT MECHANISM IS DROPPED, PERSONNEL BENEATH OR NEAR IT COULD BE SERIOUSLY OR FATALY INJURED. PERSONNEL COULD BE INJURED IF THEY MOVE IT IMPROPERLY. BEFORE ATTEMPTING TO GAIN ACCESS TO THE STOW/DEPLOY CHAIN IDLER AND DRIVE SPROCKET ASSEMBLIES, SECURE THE LIFT MECHANISM WITH JACKS THAT ARE SUITABLE FOR THE TOTAL WEIGHT OF THE LIFT. DO NOT MOVE DIRECTLY BENEATH THE LIFT. USE EXTREME CARE TO SUPPORT THIS WEIGHT.

9. Support the entire lift assembly with suitable jacks capable of carrying the lift mechanisms full weight.

10. Pull the lift platform curbside until access is gained to the idler and drive sprockets. Do not fully remove the lift mechanism. The lift mechanism will be partially supported with the slide channels by the bearing blocks resting within the slide channel assembly.



11. Note the orientations of the drive and idler sprockets in order to facilitate reinstallation. Remove the old secondary stow/deploy chain assemblies. To minimize the risk of galling, apply anti-seize to the exposed threads of the chain tensioner prior to removing the jam nut and retainer nut.
12. Inspect the drive sprockets and idler sprockets for wear or damage. Inspect idler trunnion, bushing, snap ring, and sprocket for wear or damage.

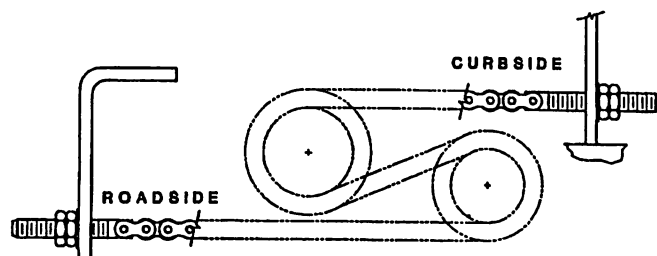
**NOTE:** If the idler or drive sprockets have minor or local damage, they can be dressed with a fine file. However, if visible wear and/or peening are present, the sprocket(s) should be replaced. Idler sprockets should rotate freely on the trunnion shafts, if not the idler assemblies should be replaced.



### STOW/DEPLOY SECONDARY CHAIN INSTALLATION

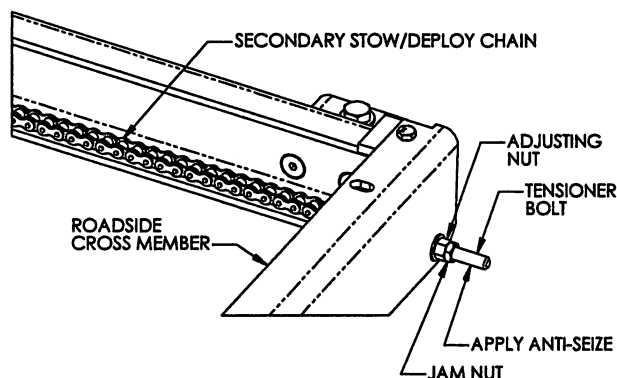
#### TO INSTALL THE STOW/DEPLOY SECONDARY CHAIN:

1. Place the new stow/deploy secondary chain assemblies over the idler sprocket and around the driven sprocket. Count the number of pitches on each chain segment; confirm that the chain segments have the same number of pitches from the center of the idler sprockets to the end of each chain.



**NOTE:** Failure to allow the same number of pitches from the center of the idler or drive sprockets on each chain segment, will make correct stow/deploy secondary chain adjustment impossible.

2. Have an assistant hold the roadside end of the chain segments within each slide channel to prevent the chains from bunching while the lift platform is guided back into the slide channels. Push the lift mechanism roadside approximately 24 inches.
3. Apply anti-seize to the roadside chain tensioner, and thread the adjusting nut onto the tensioner bolt.
4. Slowly push the lift platform in a curbside direction until the slack is removed from the roadside portion of the secondary stow/deploy chains.

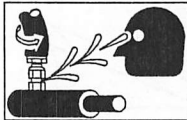


5. Install the curbside chain tensioners. Tension adjusting nut enough to remove slack from the curbside portion of the stow/deploy chain segments.
6. Install the bumper stops, bumper brackets, hose cable assemblies and tensioner jam-nuts.
7. Adjust the stow/deploy secondary chains per previously noted procedures. Lubricate chain assemblies with chain oil (P/N P515-0014).
8. Cycle to confirm adjustments, tension on chains, and hose routing.





### STOW/DEPLOY MOTOR REMOVAL



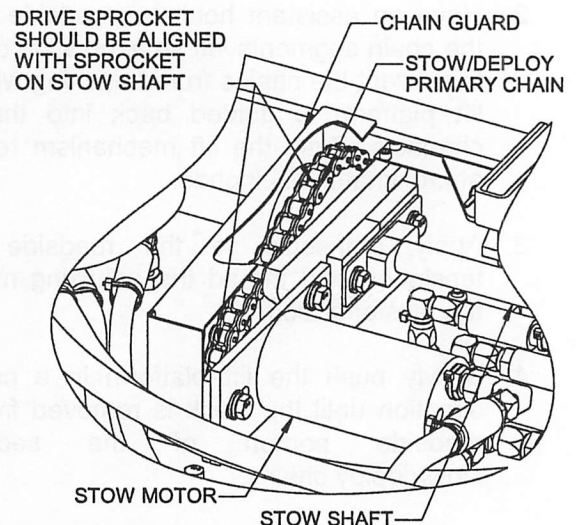
OPENING OR REMOVING THE STOW/DEPLOY MOTOR AND/OR ITS CONNECTING HOSES WHILE IT IS UNDER PRESSURE COULD RELEASE OIL UNDER PRESSURES OF UP TO 2000 PSI. PERSONNEL NEAR THE LIFT COULD BE SPRAYED WITH THE OIL.

DISCONTINUE ANY PUMPING AND RELIEVE HYDRAULIC PRESSURE IN THE SYSTEM BEFORE ATTEMPTING TO OPEN AND/OR REMOVE THE MOTOR OR HOSES. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN INJURY FROM OIL SPRAYING INTO THE EYES, OIL BURNS, AND/OR IMPACT BY A WHIPPING HYDRAULIC HOSE.

#### TO REMOVE THE STOW/DEPLOY HYDRAULIC MOTOR:

1. Remove the splash shield.
2. Deploy the lift mechanism to the fully deployed position.

**NOTE:** If the stow/deploy motor is frozen or otherwise not rotating, it may be necessary to disconnect the roadside and curbside tensioners to manually slide the lift mechanism to a deployed position. In order to do this, the stow latch must be released.



3. Remove the drive chain guard.
4. Locate and remove the master link in the drive chain.
5. Disconnect and cap the two hydraulic hoses to the drive motor.
6. Remove the three bolts attaching the motor mounting plate to the power platform weldment.
7. Remove sprocket and mounting plate from the motor.
8. Inspect sprocket and chain for wear.
9. Reassemble in reverse order. Note the alignment of the motor and drive sprocket. Adjust if necessary.
10. Lubricate with special chain oil (P/N P515-0005).
11. Adjust stow/deploy primary chain per previously noted procedures.



### MASTER/SLAVE ARM REMOVAL



THE LIFT PLATFORM WEIGHS APPROXIMATELY 200 POUNDS AND IS AN AWKWARD WEIGHT TO MANIPULATE. IF THE PLATFORM DROPS, PERSONNEL BENEATH IT COULD BE SERIOUSLY INJURED. PERSONNEL COULD BE INJURED IF THEY MOVE IT IMPROPERLY.



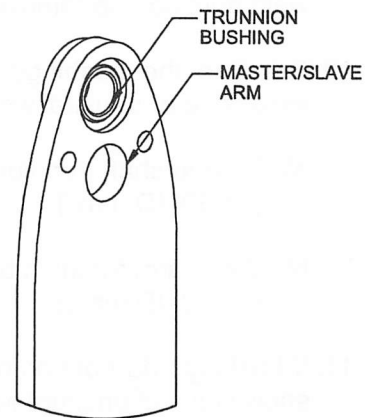
BEFORE ATTEMPTING TO REMOVE THE LIFT PLATFORM, SECURELY SUPPORT IT WITH SUITABLE JACKS THAT CAN WITHSTAND THE TOTAL WEIGHT OF THE PLATFORM. DO NOT PLACE YOUR BODY OR LIMBS DIRECTLY BENEATH THE PLATFORM WHEN REMOVING IT. WHEN MOVING THE PLATFORM, USE CORRECT LIFTING TECHNIQUES TO AVOID BACK INJURY. ALWAYS USE AT LEAST TWO PERSONNEL TO PERFORM THE TASK, AND GET MORE HELP IF THE WEIGHT IS TOO GREAT TO HANDLE SMOOTHLY. PERSONNEL COULD BE SERIOUSLY INJURED IF THE LIFT PLATFORM FALLS ONTO THEM. PERSONNEL COULD BE SERIOUSLY INJURED BY IMPROPERLY MOVING OR LIFTING THE PLATFORM.

#### TO REMOVE THE MASTER AND SLAVE ARM ASSEMBLIES, TO GAIN ACCESS TO THE PIVOT POINTS AND/OR REPLACE THE POWER PLATFORM KICK-OFF SPRINGS:

1. Remove the lift platform per previous procedures.
2. Inspect the lift platform trunnion bushings for wear (0.623" to 0.653" inside diameter).
3. Orient the master and slave arms horizontally.

**NOTE:** The orientation and distance between the slave chain segments and sprockets.

4. Remove the slave chain turnbuckles and slave chain assemblies.
5. Remove the slave arm retaining bolt on each slave arm.
6. Remove the slave arms.
7. Remove the lift cylinders from the lift master chains. Refer to lift cylinder removal procedure.
8. Loosen the four set screws on the torque shaft coupling.





### MASTER/SLAVE ARM REMOVAL

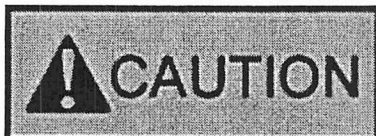
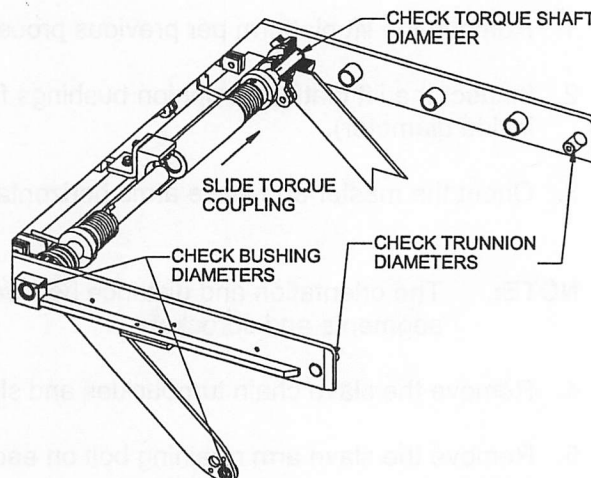
#### MASTER/SLAVE ARM REMOVAL (continued)



THE TORQUE SHAFT COUPLING, THE TORQUE SHAFT, MASTER ARM WELDMENTS AND SLAVE ARM WELDMENTS MAY BE DAMAGED BY PRYING, HAMMERING, OR HEATING IN AN ATTEMPT TO SLIDE THE TORQUE SHAFT COUPLING OFF THE MASTER ARMS WELDMENTS. THE TORQUE SHAFT COUPLINGS AND MASTER ARMS ARE TYPICALLY MATCHED MACHINED SETS AND MUST BE REPLACED AS A SET IF DAMAGED.

WHEN MOVING THE TORQUE SHAFT COUPLING, DO NOT PRY, SLEDGE, OR APPLY HEAT TO THE COUPLING OR SHAFT. ABUSE OF THE TORQUE SHAFT OR COUPLING DURING REMOVAL MAY DAMAGE THE COUPLING OR SHAFT AND REQUIRE REPLACEMENT OF THE TORQUE SHAFT COUPLING AND MASTER ARM SETS. TRUNNION SHAFTS MAY BE DAMAGED BY AN ATTEMPT TO REMOVE THEM FROM ANY ARM, AND TRUNNIONS MAY BE DAMAGED BY AN ATTEMPT TO MACHINE THEM. DO NOT ATTEMPT TO REMOVE TRUNNION SHAFTS FROM ANY ARM. REPLACE ANY OUT OF SPECIFICATION TRUNNION BUSHINGS. ATTEMPTS TO REMOVE THE TRUNNION SHAFT OR MACHINE A TRUNNION MAY RESULT IN DAMAGE OR EXCESSIVELY LOOSE FITS THAT MAY CAUSE LIFT DAMAGE.

9. Move the torque shaft coupling in a direction either forward or rear such that the master arm weldment can be removed.
10. Examine the bushings on the strong arms for excessive or unusual wear patterns.
  - a) Torque shaft trunnion bushing (1.030" ID max.)
  - b) Slave arm trunnion bushing (1.030" ID max.)
11. If bushings do not conform to dimensions and/or show signs of unusual wear, replace bushings.



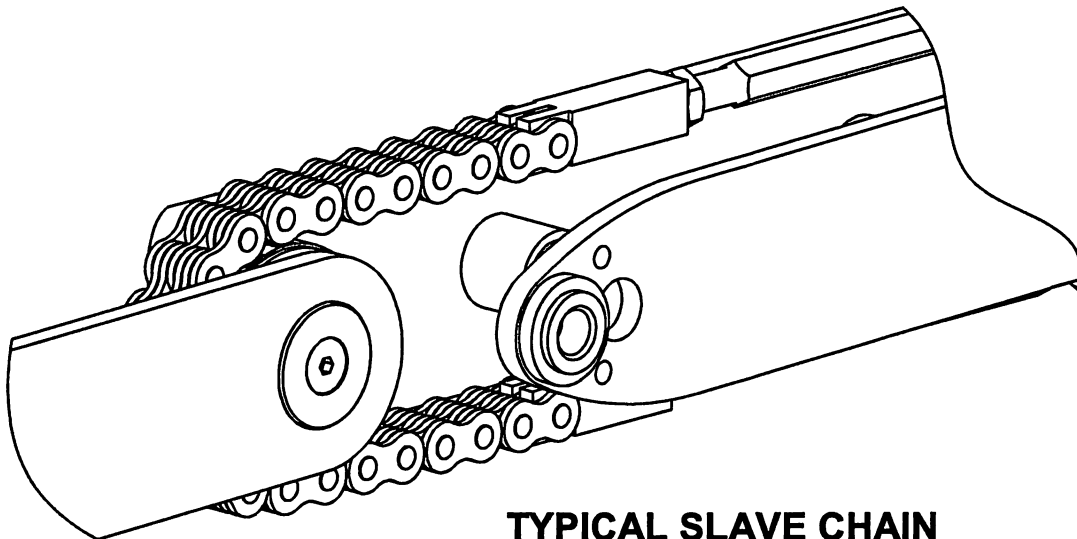
TRUNNION BUSHINGS MAY BE DAMAGED IF INCORRECT TOOLS OR POOR TECHNIQUES ARE USED TO INSTALL THE BUSHINGS. USE AN ARBOR PRESS TO PRESS THE BUSHING INTO THE BORE. USE EXTREME CARE WITH THE BUSHINGS, THEY ARE EASILY DAMAGED IF DROPPED OR MISHANDLED.



## **MASTER/SLAVE ARM INSTALLATION**

### **TO INSTALL THE MASTER AND/OR SLAVE ARM ASSEMBLIES:**

1. Coat the torque shaft with anti-seize or assembly lube.
2. Install the master arms and torque shaft coupling.
3. Once the master arms and coupling is in place, apply service removable loctite to the setscrews and install them on the torque shaft coupling.
4. Install slave arms.
5. Install the lift platform. Refer to previously noted procedures.
6. Adjust slave chains. Refer to previously noted procedures.
7. Cycle the lift to confirm adjustments and settings. Readjust as required.



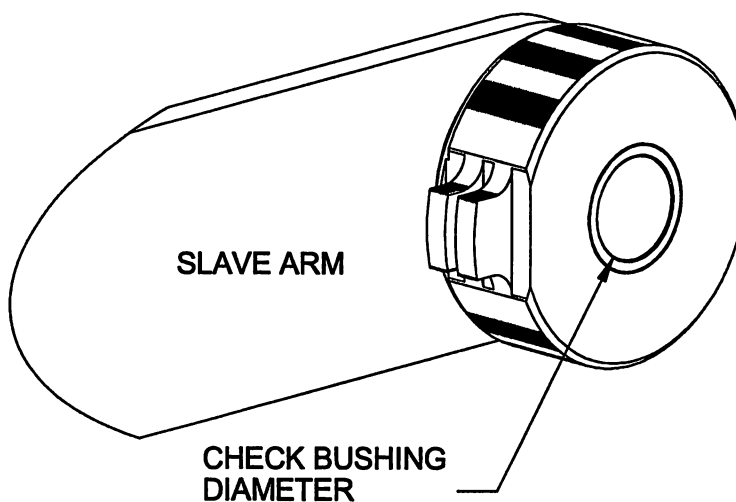
**TYPICAL SLAVE CHAIN**



### MASTER/SLAVE ARM REMOVAL

#### MASTER/SLAVE ARM REMOVAL (continued)

12. Press bushing into bore with press arbor press. Seat the bushings within .005" to .015" above the surface of the arm weldment.
13. The inside diameters of the new bushings (after installation) should conform to the following specifications. Ream bushing to achieve proper dimensions if required:
  - a) Lift platform trunnions bushings:  
0.623" min.  
0.626" max.
  - b) Strong arm trunnion bushings:  
0.999" min.  
1.002" max.
  - c) Torque shaft trunnions  
0.999" min.  
1.002" max.





### GENERAL TROUBLESHOOTING

It is beyond the scope of this manual to include every possible sequence or occurrence of events or component faults that could cause a lift failure. Consequently, the troubleshooting procedures identify only the primary source of possible faults and solutions.

Troubleshooting, in a general sense, utilizes the same basic methods. The defect is identified and a process of elimination reduces the possible range of failures. Paramount to any troubleshooting procedure is to identify the source of the failure. The operational classifications of the lift may be broken down into three interacting, but separate, systems:

- a) Electric: dash control switches, limit switches, relays, and associated electrical circuitry.
- b) Hydraulic: power steering, diverter valve, power transfer unit (if equipped), directional control valves, motors, cylinders, and other fluid systems.
- c) Mechanical: chains, master/slave arms, barriers, bearings, and other mechanical systems.

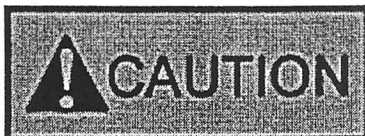
Consequently, the first step in any troubleshooting task is to locate the possible source of the failure, be it hydraulic, electrical, or mechanical.

The lift electrical system contains light emitting diodes (LED's) to identify the operation of not only the electrical system but also the electrical systems interaction with the hydraulic system.

**NOTE:** To distinguish between an electrical or hydraulic fault, refer to the lift electrical circuit board. Electrical outputs to the directional control valves are green. Locate the hydraulic function in question from the LED display chart and note if the LED is lit or not on the circuit board. A lit LED generally indicates that a signal is being sent to the valve and the electrical system is operating properly. If the LED for the hydraulic function is not lit, a failure is in the electrical system.

**NOTE:** The hydraulic system can be checked by operating the manual override system, which bypasses all electrical circuitry.

**NOTE:** The distinction between a mechanical failure source and an electrical or hydraulic failure is much less subtle and is beyond the scope of this manual.



**MANUAL OPERATION BYPASSES ALL ELECTRICAL AND/OR MECHANICAL SAFETY FEATURES**





This troubleshooting procedure will progress as follows:

- The lift position will be identified.
- The failure mode will be described.
- The primary electrical, hydraulic and mechanical faults will be noted.

### EXAMPLE

(Reference the Troubleshooting Tables on the following pages)

• LIFT POSITION IDENTIFICATION	
• FAILURE MODE	
• PRIMARY FAULT (ELECTRICAL, HYDRAULIC, MECHANICAL)	PRIMARY FAULT CHECK POINTS (ELECTRICAL, HYDRAULIC, MECHANICAL)

**NOTE:** The state of the significant LED's for each failure mode will be identified.

### BE AWARE OF THE FOLLOWING PRIOR TO USING THESE TROUBLESHOOTING PROCEDURES

All electrical signals pass from the dash controls to the lift electrical circuitry through a series of disconnects. The connectors should be securely connected. The pins within the connectors should not be loose or bent.

On electric trolley buses, all electrical signals pass from the dash controls through an isolator box and to the lift electrical circuitry. Therefore, the isolator box should be checked in conjunction with the dash control circuitry anytime the dash controls are identified as a possible fault reason. This applies to Electric Trolley Buses ONLY.

1. When the lift "power" switch is activated (Lift Power ON)
  - the Dash Control: Sensor Power LED should be lit.
2. When the function switch(s) are activated (Raise, Lower, Stow, or Deploy)
  - the Valves: Pump Diverter LED should be lit.

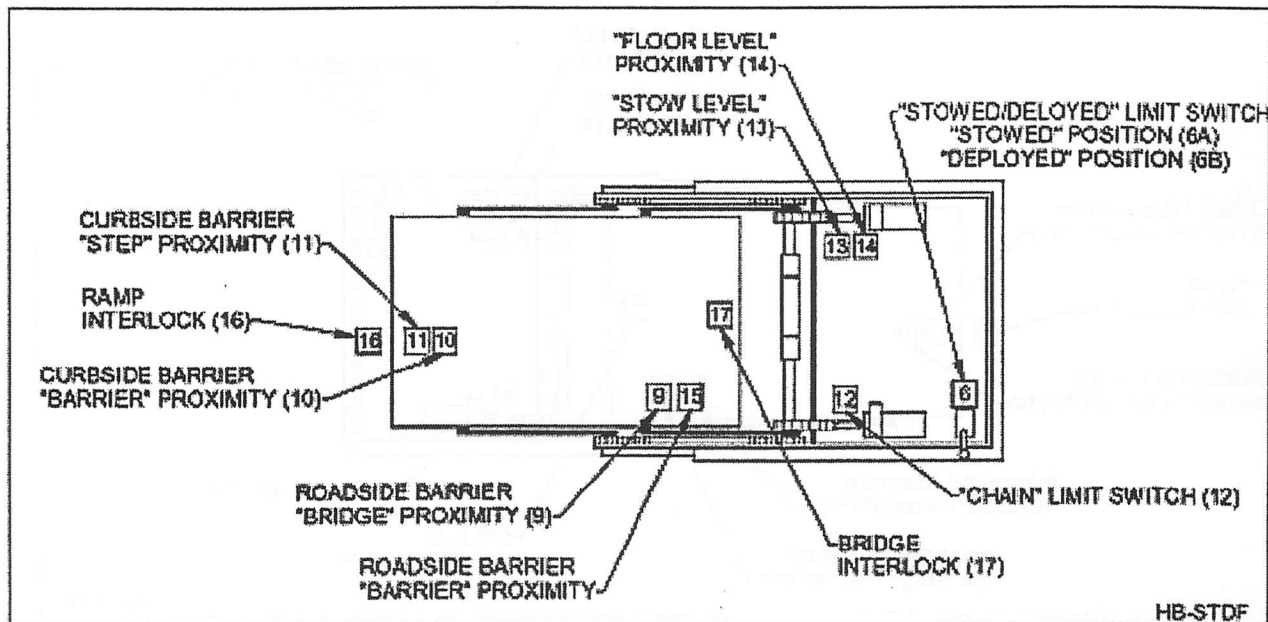


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## Section 8 TROUBLESHOOTING

### SWITCH ACTIVATION CHART

USE THIS CHART FOR LIFTS WITH THE STOW/DEPLOY LIMIT SWITCH MOUNTED NEAR THE FORWARD LIFT CYLINDER



ACTIVATED SWITCHES	POSITION OF LIFT
6A* , 9, 10, 12, 16	LIFT IS STOWED. "STEP" POSITION.
9, 10, 12, 16	LIFT IS BETWEEN STOWED AND DEPLOYED.
6B**, 11, 12, 15, 16	LIFT IS DEPLOYED. BOTH BARRIERS IN BARRIER POSITION.
6B**, 11, 12, 15, 16	LIFT IS BELOW STOW LEVEL. BOTH BARRIERS IN BARRIER POSITION.
6B**, 10, 11, 15, 16	LIFT ON GROUND. ROADSIDE BARRIER IN BARRIER POSITION. CURBSIDE BARRIER IN RAMP POSITION.
6B**, 11, 12, 13, 15, 16	LIFT IS ABOVE STOW LEVEL. BOTH BARRIERS IN BARRIER POSITION.
6B**, 9, 11, 12, 13, 14, 16	LIFT AT BUS FLOOR. ROADSIDE BARRIER IN BRIDGE POSITION. CURBSIDE BARRIER IN BARRIER POSITION.
<b>NOTE:</b>	** COUNTER CLOCKWISE - AS VIEWED FROM ABOVE * CLOCKWISE - AS VIEWED FROM ABOVE

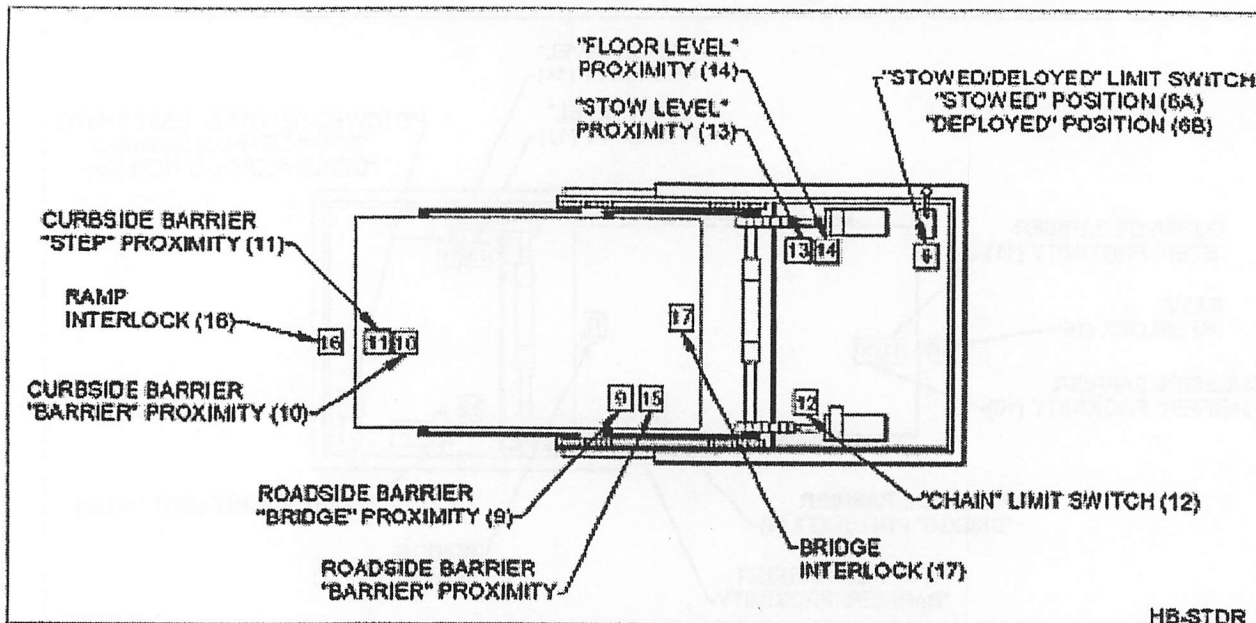


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## Section 8 TROUBLESHOOTING

### SWITCH ACTIVATION CHART

Use this chart for lifts with the stow/deploy limit switch mounted near the REAR lift cylinder



HB-STDR

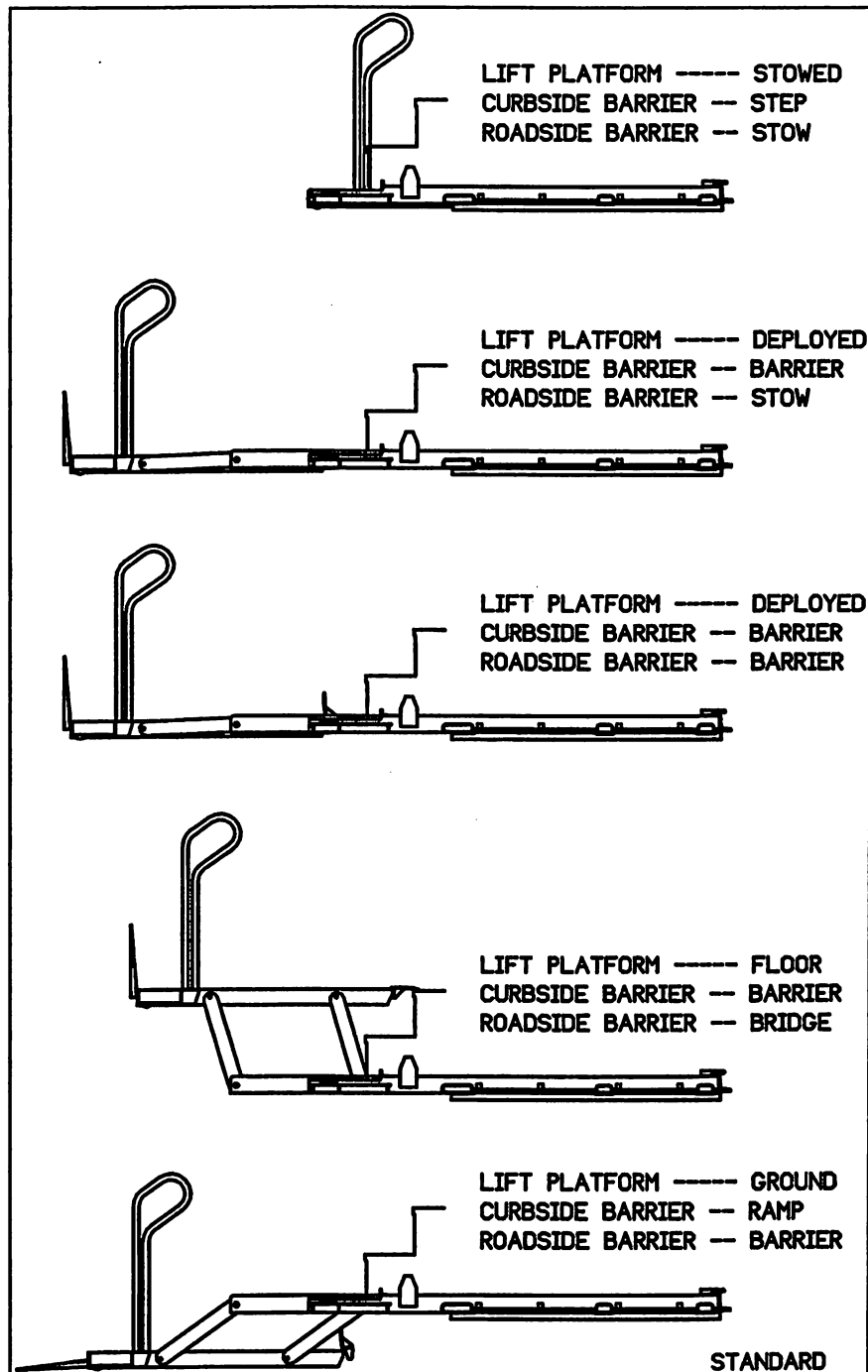
ACTIVATED SWITCHES	POSITION OF LIFT
6A**, 9, 10, 12, 16	LIFT IS STOWED. "STEP" POSITION.
9, 10, 12, 16	LIFT IS BETWEEN STOWED AND DEPLOYED.
6B*, 11, 12, 15, 16	LIFT IS DEPLOYED. BOTH BARRIERS IN BARRIER POSITION.
6B*, 11, 12, 15, 16	LIFT IS BELOW STOW LEVEL. BOTH BARRIERS IN BARRIER POSITION.
6B*, 10, 11, 15, 16	LIFT ON GROUND. ROADSIDE BARRIER IN BARRIER POSITION. CURBSIDE BARRIER IN RAMP POSITION.
6B*, 11, 12, 13, 15, 16	LIFT IS ABOVE STOW LEVEL. BOTH BARRIERS IN BARRIER POSITION.
6B*, 11, 12, 13, 14, 16	LIFT AT BUS FLOOR. ROADSIDE BARRIER IN BRIDGE POSITION. CURBSIDE BARRIER IN BARRIER POSITION.
<b>NOTE:</b>	** COUNTER CLOCKWISE - AS VIEWED FROM ABOVE * CLOCKWISE - AS VIEWED FROM ABOVE



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## Section 8 TROUBLESHOOTING

### LIFT POSITION CHART





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## Section 8 TROUBLESHOOTING

HYDRAULIC DIAGRAM SYMBOLS	
	CHECK VALVE
	PILOT (TO OPEN) OPERATED CHECK VALVE
	FIXED RESTRICTION (FLOW CONTROL)
	ADJUSTABLE RESTRICTION (FLOW CONTROL)
	ADJUSTABLE RESTRICTION WITH FREE REVERSE FLOW
	PRESSURE COMPENSATED (ADJUSTABLE FLOW CONTROL)
	FILTER
	RESERVOIR
	PUMP
	HAND PUMP
	HAND PUMP, DOUBLE ACTING
	MOTOR ELECTRIC
	MOTOR, HYDRAULIC (BI-DIRECTIONAL)
	RELIEF VALVE, ADJUSTABLE
	DIRECTIONAL CONTROL VALVE, 3-WAY
	SOLOENOID OPERATOR
	SPRING RETURN
	HYDRAULIC CYLINDER



ELECTRICAL DIAGRAM SYMBOLS	
	DIODE
	LIGHT EMITTING DIODE (LED)
	RESISTOR
	METAL OXIDE VARISTOR
	SOLENOID COIL
	RELAY COIL
	RELAY CONTACTS (OPEN)
	RELAY CONTACTS (CLOSED)
	SENSITIVE EDGES
	SENSITIVE MAT
	LIMIT SWITCH (NORMALLY CLOSED)
	LIMIT SWITCH (NORMALLY OPEN)
	LIMIT SWITCH (NORMALLY CLOSED; SHOWN OPEN)
	LIMIT SWITCH (NORMALLY OPEN; SHOWN CLOSED)
	COUNTER
	CIRCUIT NOT CONNECTED
	CIRCUIT CONNECTIONS
	MALE CONNECTOR
	FEMALE CONNECTOR





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## Section 8 TROUBLESHOOTING

### HYDRAULIC FUNCTION COLOR CODE IDENTIFICATION

LIFT FUNCTION	COLOR
Pressure	Red
Return (tank)	Blue
Stow Mechanism	White
Deploy Mechanism	Black
Extend Lift Platform Cylinder	Brown
Retract Lift Platform Cylinder	Orange
Extend Curbside Barrier Cylinder	Green
Retract Curbside Barrier Cylinder	Yellow
Extend Roadside Barrier Cylinder	Purple
Retract Roadside Barrier Cylinder	Gray
Extend Stow Latch Cylinder	No color



## **TROUBLESHOOTING INDEX**

<b>1.0</b>	<b>FROM STOWED POSITION TO DEPLOYED</b>	<b>PAGE</b>
1.1	LIFT PLATFORM FAILS TO DEPLOY	8 – 11
<b>2.0</b>	<b>FROM DEPLOYED POSITION TO GROUND</b>	
2.1	CURBSIDE BARRIER FAILS TO FORM TO THE BARRIER POSITION	8 – 12
2.2	ROADSIDE BARRIER FAILS TO FORM TO THE BARRIER POSITION	8 – 13
2.3	LIFT PLATFORM FAILS TO LOWER	8 – 14
2.4	LIFT PLATFORM LOWERS TO GROUND LEVEL BUT CURBSIDE BARRIER FAILS TO FORM A RAMP	8 – 15
<b>3.0</b>	<b>FROM DEPLOYED POSITION TO COACH FLOOR</b>	
3.1	CURBSIDE BARRIER FAILS TO FORM TO THE BARRIER POSITION	8 – 16
3.2	ROADSIDE BARRIER FAILS TO FORM TO THE BARRIER POSITION	8 – 17
3.3	LIFT PLATFORM FAILS TO RAISE TO THE COACH FLOOR	8 – 18
3.4	THE ROADSIDE BARRIER FAILS TO FORM A BRIDGE TO THE COACH FLOOR	8 – 19
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5.3	LIFT PLATFORM ACHIEVES STOW HEIGHT BUT THE ROADSIDE BARRIER FAILS TO LOWER TO THE BRIDGE POSITION (AT THIS POSITION, THE SENSOR "ABOVE FLOOR HEIGHT L.E.D." IS NOT LIT)	8 – 24
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## Section 8 TROUBLESHOOTING

### TROUBLESHOOTING INDEX

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<b>6.5</b>	THE LIFT PLATFORM ACHIEVES STOW HEIGHT BUT THE CURBSIDE BARRIER FAILS TO FORM A STEP	<b>8 – 31</b>
<b>6.6</b>	THE CURBSIDE BARRIER FORMS THE STEP POSITION AND THE ROADSIDE BARRIER LOWERS TO THE BRIDGE POSITION, BUT THE LIFT PLATFORM FAILS TO STOW	<b>8 – 32</b>
<b>7.0</b>	<b>GROUND TO COACH FLOOR</b>	
<b>7.1</b>	THE CURBSIDE BARRIER FAILS TO FORM INTO THE BARRIER POSITION	<b>8 – 33</b>
<b>7.2</b>	THE LIFT PLATFORM FAILS TO RAISE	<b>8 – 34</b>
<b>7.3</b>	THE LIFT PLATFORM REACHES FLOOR HEIGHT, BUT THE ROADSIDE BARRIER FAILS TO LOWER TO THE BRIDGE POSITION	<b>8 – 35</b>



### TROUBLESHOOTING PROCEDURES

#### 1 LIFT POSITION: FROM STOWED POSITION TO DEPLOYED

Engage the lift control switch  
to  
• DEPLOY •

##### 1.1 FAILURE MODE: LIFT PLATFORM FAILS TO DEPLOY

<b>ELECTRICAL</b>	<b>ITEM</b>	<b>CONTROLLER</b>	<b>OPERATIONAL LED STATUS</b>
	1	DASH CONTROL:	•DEPLOY• LED SHOULD BE ON
	2	SENSOR:	INNER BARRIER •BRIDGE• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •CURBSIDE• LED SHOULD BE ON
	4	SENSOR:	•BRIDGE INTERLOCK• LED SHOULD BE ON
	5	VALVE:	•DEPLOY• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	THE "DEPLOY" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	SLIDE CHANNEL OUT OF ALIGNMENT
	2	HOSE/CABLE ROUTING INCORRECT
	3	STOW LATCH DID NOT RELEASE
	4	PRIMARY AND/OR SECONDARY STOW/DEPLOY CHAIN TENSION OUT OF ADJUSTMENT
	5	RESTRICTION WITHIN THE ORIFICE AT THE STOW/DEPLOY MOTOR (WHITE FITTINGS)



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## Section 8 TROUBLESHOOTING

### TROUBLESHOOTING PROCEDURES

#### 2 LIFT POSITION: FROM DEPLOYED POSITION TO GROUND

Engage the lift control switch  
to  
• LOWER •

##### 2.1 FAILURE MODE: OUTER BARRIER FAILS TO DEPLOY

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•LOWER• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	VALVE:	OUTER BARRIER •RAMP• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE OUTER BARRIER "RAMP" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED
	2	RESTRICTION WITHIN THE ORIFICE IN THE OUTER BARRIER MANIFOLD

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	CURBSIDE BARRIER LINKAGE OUT HAS EXCESSIVE WEAR
	2	CURBSIDE BARRIER PLATE, HINGE, AND/OR HINGE PIN HAVE EXCESSIVE WEAR



### TROUBLESHOOTING PROCEDURES

#### 2 LIFT POSITION: FROM DEPLOYED POSITION TO GROUND

Engage the lift control switch  
to  
• LOWER •

#### 2.2 FAILURE MODE: INNER BARRIER FAILS TO DEPLOY

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•LOWER• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•BRIDGE INTERLOCK• LED SHOULD BE ON
	4	VALVE:	INNER BARRIER •BRIDGE• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE INNER BARRIER "BARRIER" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED
	2	RESTRICTION WITHIN THE ORIFICE ON THE VALVE BANK "GRAY" FITTING

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	INNER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	INNER BARRIER PLATE, HINGE, AND/OR HINGE PINS HAVE EXCESSIVE WEAR



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## Section 8 TROUBLESHOOTING

### TROUBLESHOOTING PROCEDURES

#### 2 LIFT POSITION: FROM DEPLOYED POSITION TO GROUND

Engage the lift control switch  
to  
• LOWER •

#### 2.3 FAILURE MODE: LIFT PLATFORM FAILS TO LOWER

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•LOWER• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •ROADSIDE • LED SHOULD BE ON
	4	SENSOR:	INNER BARRIER •R/S BARRIER• LED SHOULD BE ON
	5	VALVE:	•LOWER• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE "LOWER" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED
	2	RESTRICTION WITHIN THE ORIFICE AT THE ROD END OF THE LIFT CYLINDER(S)

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY





### TROUBLESHOOTING PROCEDURES

**2**

LIFT POSITION: **FROM DEPLOYED POSITION TO GROUND**

Engage the lift control switch  
to  
• LOWER •

**2.4**

FAILURE MODE: **LIFT PLATFORM LOWERS TO GROUND LEVEL BUT OUTER BARRIER FAILS TO EXTEND TO RAMP POSITION**

<b>ELECTRICAL</b>	<b>ITEM</b>	<b>CONTROLLER</b>	<b>OPERATIONAL LED STATUS</b>
	1	DASH CONTROL:	•LOWER• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•GROUND SENSOR• LED SHOULD BE ON
	4	VALVE:	OUTER BARRIER •RAMP• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	THE OUTER BARRIER "RAMP" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED
	2	RESTRICTION WITHIN THE ORIFICE IN THE OUTER BARRIER MANIFOLD
	3	500 P.S.I. CHECK VALVE IS NOT SEATED

<b>MECHANICAL</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	OUTER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	OUTER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



### TROUBLESHOOTING PROCEDURES

#### 3 LIFT POSITION: FROM DEPLOYED POSITION TO COACH FLOOR

Engage the lift control switch  
to  
• RAISE •

#### 3.1 FAILURE MODE: OUTER BARRIER FAILS TO DEPLOY

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•RAISE• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•EDGE• LED SHOULD BE OFF
	4	VALVE:	OUTER BARRIER •RAMP• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE OUTER BARRIER DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED
	2	RESTRICTION WITHIN THE ORIFICE IN THE OUTER BARRIER MANIFOLD

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	OUTER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	CURBSIDE BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



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## Section 8 TROUBLESHOOTING

### TROUBLESHOOTING PROCEDURES

#### **3** LIFT POSITION: **FROM DEPLOYED POSITION TO COACH FLOOR**

Engage the lift control switch  
to  
• RAISE •

#### **3.2** FAILURE MODE: **INNER BARRIER FAILS TO DEPLOY**

<b>ELECTRICAL</b>	<b>ITEM</b>	<b>CONTROLLER</b>	<b>OPERATIONAL LED STATUS</b>
	1	DASH CONTROL:	•RAISE• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•EDGE• LED SHOULD BE OFF
	4	SENSOR:	•BRIDGE INTERLOCK• LED SHOULD BE ON
	5	VALVE:	INNER BARRIER •BARRIER• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	THE "RAISE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED
	2	RESTRICTION WITHIN THE ORIFICE AT THE ROD END OF THE LIFT CYLINDER(S)

<b>MECHANICAL</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY



### TROUBLESHOOTING PROCEDURES

**3** LIFT POSITION: **FROM DEPLOYED POSITION TO COACH FLOOR**

Engage the lift control switch  
to  
• RAISE •

**3.3** FAILURE MODE: **LIFT PLATFORM FAILS TO RAISE TO THE COACH FLOOR**

<b>ELECTRICAL</b>	<b>ITEM</b>	<b>CONTROLLER</b>	<b>OPERATIONAL LED STATUS</b>
	1	DASH CONTROL:	•RAISE• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •ROADSIDE • LED SHOULD BE ON
	4	SENSOR:	INNER BARRIER •R/S BARRIER• LED SHOULD BE ON
	5	SENSOR:	•EDGE• LED SHOULD BE OFF
	6	VALVE:	•RAISE• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	THE "RAISE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED
	2	RESTRICTION WITHIN THE ORIFICE AT THE ROD END OF THE LIFT CYLINDER(S)

<b>MECHANICAL</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY



### TROUBLESHOOTING PROCEDURES

**3**

LIFT POSITION:

**FROM DEPLOYED POSITION TO COACH FLOOR**

Engage the lift control switch  
to  
• RAISE •

**3.4**

FAILURE MODE:

**THE INNER BARRIER FAILS TO FORM A BRIDGE TO THE COACH FLOOR**

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•RAISE• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•FLOOR LEVEL• LED SHOULD BE ON
	4	SENSOR:	•EDGE• LED SHOULD BE OFF
	5	VALVE:	INNER BARRIER •BRIDGE• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE INNER BARRIER "BRIDGE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	INNER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	INNER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



### TROUBLESHOOTING PROCEDURES

**4**

LIFT POSITION:

**FROM COACH FLOOR TO GROUND  
POSITION**

Engage the lift control switch  
to  
• LOWER •

**4.1**

FAILURE MODE:

**THE INNER BARRIER FAILS TO DEPLOY**

#### **ELECTRICAL**

##### ITEM

##### CONTROLLER

##### OPERATIONAL LED STATUS

- |   |               |  |
|---|---------------|--|
| 1 | DASH CONTROL: | •LOWER• LED SHOULD BE ON                 |
| 2 | SENSOR:       | •DEPLOYED• LED SHOULD BE ON              |
| 3 | SENSOR:       | •BRIDGE INTERLOCK• LED SHOULD BE ON      |
| 3 | VALVE:        | INNER BARRIER •BARRIER• LED SHOULD BE ON |

#### **HYDRAULIC**

##### ITEM

##### POSSIBLE REASONS FOR FAILURE

- |   |  |
|---|--|
| 1 | THE INNER BARRIER "BARRIER" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED |
|---|--|

#### **MECHANICAL**

##### ITEM

##### POSSIBLE REASONS FOR FAILURE

- |   |   |
|---|---|
| 1 | INNER BARRIER LINKAGE HAS EXCESSIVE WEAR                      |
| 2 | INNER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR |



### TROUBLESHOOTING PROCEDURES

**4**

LIFT POSITION:

**FROM COACH FLOOR TO GROUND  
POSITION**

Engage the lift control switch  
to  
• LOWER •

**4.2**

FAILURE MODE:

**THE LIFT PLATFORM FAILS TO LOWER**

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•LOWER• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •ROADSIDE• LED SHOULD BE ON
	4	SENSOR:	INNER BARRIER •R/S BARRIER• LED SHOULD BE ON
	5	SENSOR:	•GROUND SENSOR• LED SHOULD BE OFF
	6	VALVE:	•LOWER• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE "LOWER" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY





### TROUBLESHOOTING PROCEDURES

**5** LIFT POSITION: **FROM COACH FLOOR TO STOWED POSITION**

Engage the lift control switch  
to  
• STOW •

**5.1** FAILURE MODE: **THE INNER BARRIER FAILS TO DEPLOY**

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•BRIDGE INTERLOCK• LED SHOULD BE ON
	4	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	5	VALVE:	INNER BARRIER • BARRIER• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE INNER BARRIER "BARRIER" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	INNER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	INNER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



**TROUBLESHOOTING PROCEDURES**

**5** LIFT POSITION: **FROM COACH FLOOR TO STOWED POSITION**

Engage the lift control switch  
to  
• STOW •

**5.2** FAILURE MODE: **THE LIFT PLATFORM FAILS TO LOWER**

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •ROADSIDE• LED SHOULD BE ON
	4	SENSOR:	INNER BARRIER •BARRIER• LED SHOULD BE ON
	5	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	6	VAVLE:	•LOWER• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE "LOWER" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY



### TROUBLESHOOTING PROCEDURES

<b>5</b>	LIFT POSITION:	<b>FROM COACH FLOOR TO STOWED POSITION</b>	Engage the lift control switch to • STOW •
<b>5.3</b>	FAILURE MODE:	LIFT PLATFORM ACHIEVES STOW HEIGHT, BUT THE ROADSIDE BARRIER FAILS TO LOWER TO THE BRIDGE POSITION (AT THIS POSITION, THE SENSOR "ABOVE FLOOR HEIGHT LED" IS NOT LIT)	

<b>ELECTRICAL</b>	<b>ITEM</b>	<b>CONTROLLER</b>	<b>OPERATIONAL LED STATUS</b>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	4	VALVE:	INNER BARRIER •BARRIER• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	THE INNER BARRIER "BRIDGE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	INNER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	INNER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



### TROUBLESHOOTING PROCEDURES

**5**

LIFT POSITION:

**FROM COACH FLOOR TO STOWED POSITION**

Engage the lift control switch  
to  
• STOW •

**5.4**

FAILURE MODE:

**LIFT PLATFORM ACHIEVES STOW HEIGHT, BUT THE CURBSIDE BARRIER FAILS TO FORM A STEP (AT THIS POSITION, THE SENSOR "ABOVE FLOOR HEIGHT LED" IS NOT LIT)**

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•RAMP INTERLOCK• LED SHOULD BE OFF
	4	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	5	VALVE:	OUTER BARRIER •STEP• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE OUTER BARRIER "STEP" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	OUTER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	OUTER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



### TROUBLESHOOTING PROCEDURES

**5** LIFT POSITION: **FROM COACH FLOOR TO STOWED POSITION**

Engage the lift control switch  
to  
• STOW •

**5.5** FAILURE MODE: **THE ROADSIDE BARRIER IS IN THE STOWED POSITION, BUT THE LIFT FAILS TO STOW**

<b>ELECTRICAL</b>	<b>ITEM</b>	<b>CONTROLLER</b>	<b>OPERATIONAL LED STATUS</b>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	INNER BARRIER •BRIDGE• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER • STEP• LED SHOULD BE ON
	4	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	5	VALVE:	•STOW• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	THE "STOW" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b>ITEM</b>	<b>POSSIBLE REASONS FOR FAILURE</b>
	1	SLIDE CHANNEL OUT OF ALIGNMENT OR BINDING
	2	PRIMARY AND SECONDARY STOW/DEPLOY CHAIN TENSION OUT OF ADJUSTMENT
	3	HOSE/CABLE ROUTING BINDING
	4	RESTRICTION WITHIN THE ORIFICE AT THE STOW/DEPLOY MOTOR (WHITE FITTINGS)



### TROUBLESHOOTING PROCEDURES

#### 6 LIFT POSITION: GROUND TO STOWED POSITION

Engage the lift control switch  
to  
• STOW •

##### 6.1 FAILURE MODE: OUTER BARRIER FAILS TO DEPLOY

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •BARRIER AND STEP• LED SHOULD BE ON
	4	SENSOR:	•RAMP INTERLOCK• LED SHOULD BE OFF
	4	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	6	VALVE:	OUTER BARRIER •STEP• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE OUTER BARRIER "STEP" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	OUTER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	OUTER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



### TROUBLESHOOTING PROCEDURES

#### 6 LIFT POSITION: GROUND TO STOWED POSITION

Engage the lift control switch  
to  
• STOW •

#### 6.2 FAILURE MODE: THE LIFT PLATFORM FAILS TO RAISE

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •BARRIER• LED SHOULD BE ON
	4	SENSOR:	INNER BARRIER •BARRIER• LED SHOULD BE ON
	5	SENSOR:	•EDGE• LED SHOULD BE OFF
	7	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	6	VAVLE:	•RAISE• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE "RAISE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY





### TROUBLESHOOTING PROCEDURES

#### 6 LIFT POSITION: GROUND TO STOWED POSITION

Engage the lift control switch  
to  
• STOW •

#### 6.3 FAILURE MODE: THE LIFT PLATFORM RISES ABOVE STOW LEVEL BUT FAILS TO LOWER TO STOW LEVEL

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	VAVLE:	•LOWER• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE "LOWER" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY



### TROUBLESHOOTING PROCEDURES

**6**

LIFT POSITION: **GROUND TO STOWED POSITION**

Engage the lift control switch  
to  
• STOW •

**6.4**

FAILURE MODE: **THE LIFT PLATFORM ACHIEVES STOW HEIGHT, BUT THE INNER BARRIER DOES NOT LOWER TO BRIDGE POSITION**

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	4	VAVLE:	INNER BARRIER •BRIDGE• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE INNER BARRIER "BRIDGE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	INNER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	INNER BARRIER PLATE, HINGE, AND/OR HINGE PINS HAVE EXCESSIVE WEAR



**TROUBLESHOOTING PROCEDURES**

**6 LIFT POSITION: GROUND TO STOWED POSITION**

Engage the lift control switch  
to  
**• STOW •**

**6.5 FAILURE MODE: THE LIFT PLATFORM ACHIEVES STOW HEIGHT BUT THE OUTER BARRIER FAILS TO FORM A STEP**

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	4	SENSOR:	•RAMP INTERLOCK• LED SHOULD BE OFF
	5	VAVLE:	OUTER BARRIER •STEP• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE OUTER BARRIER "STEP" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	OUTER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	OUTER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



## TROUBLESHOOTING PROCEDURES

### 6 LIFT POSITION: GROUND TO STOWED POSITION

Engage the lift control switch  
to  
• STOW •

**6.6 FAILURE MODE: THE OUTER BARRIER FORMS THE STEP POSITION AND THE INNER BARRIER LOWERS TO THE BRIDGE POSITION, BUT THE LIFT PLATFORM FAILS TO STOW**

<u>ELECTRICAL</u>	<u>ITEM</u>	<u>CONTROLLER</u>	<u>OPERATIONAL LED STATUS</u>
	1	DASH CONTROL:	•STOW• LED SHOULD BE ON
	2	SENSOR:	OUTER BARRIER • STEP• LED SHOULD BE ON
	3	SENSOR:	INNER BARRIER •BRIDGE• LED SHOULD BE ON
	4	SENSOR:	•PASSENGER SENSOR• LED SHOULD BE OFF
	5	VALVE:	•STOW• LED SHOULD BE ON

<u>HYDRAULIC</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	THE "STOW" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<u>MECHANICAL</u>	<u>ITEM</u>	<u>POSSIBLE REASONS FOR FAILURE</u>
	1	SLIDE CHANNEL OUT OF ALIGNMENT OR BINDING
	2	PRIMARY AND SECONDARY STOW/DEPLOY CHAIN TENSION OUT OF ADJUSTMENT
	3	HOSE/CABLE ROUTING BINDING
	4	RESTRICTION WITHIN THE ORIFICE AT THE STOW/DEPLOY MOTOR (WHITE FITTINGS)



### TROUBLESHOOTING PROCEDURES

#### 7 LIFT POSITION: GROUND TO COACH FLOOR

Engage the lift control switch  
to  
• RAISE •

##### 7.1 FAILURE MODE: THE OUTER BARRIER FAILS TO DEPLOY

ELECTRICAL	ITEM	CONTROLLER	OPERATIONAL LED STATUS
	1	DASH CONTROL:	•RAISE• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•EDGE• LED SHOULD BE OFF
	4	SENSOR:	•RAMP INTERLOCK• LED SHOULD BE OFF
	5	VALVE:	OUTER BARRIER •RAMP• LED SHOULD BE ON

HYDRAULIC	ITEM	POSSIBLE REASONS FOR FAILURE
	1	THE OUTER BARRIER "STEP" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

MECHANICAL	ITEM	POSSIBLE REASONS FOR FAILURE
	1	OUTER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	OUTER BARRIER PLATE, HINGE, AND HINGE PIN HAVE EXCESSIVE WEAR



### TROUBLESHOOTING PROCEDURES

#### **7** LIFT POSITION: **GROUND TO COACH FLOOR**

Engage the lift control switch  
to  
• RAISE •

#### **7.2** FAILURE MODE: **THE LIFT PLATFORM FAILS TO RAISE**

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•RAISE• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	OUTER BARRIER •BARRIER• LED SHOULD BE ON
	4	SENSOR:	INNER BARRIER •BARRIER• LED SHOULD BE ON
	5	SENSOR:	•EDGE• LED SHOULD BE OFF
	6	VALVE:	•RAISE• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE "RAISE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	MASTER AND SLAVE ARMS ARE NOT ROTATING FREELY



## TROUBLESHOOTING PROCEDURES

### **7** LIFT POSITION: **GROUND TO COACH FLOOR**

Engage the lift control switch  
to  
• RAISE •

#### **7.3** FAILURE MODE: **THE LIFT PLATFORM REACHES FLOOR HEIGHT, BUT THE INNER BARRIER FAILS TO LOWER TO THE BRIDGE POSITION**

<b>ELECTRICAL</b>	<b><u>ITEM</u></b>	<b><u>CONTROLLER</u></b>	<b><u>OPERATIONAL LED STATUS</u></b>
	1	DASH CONTROL:	•RAISE• LED SHOULD BE ON
	2	SENSOR:	•DEPLOYED• LED SHOULD BE ON
	3	SENSOR:	•FLOOR LEVEL• LED SHOULD BE ON
	4	SENSOR:	•EDGE• LED SHOULD BE OFF
	5	VALVE:	INNER BARRIER •BRIDGE• LED SHOULD BE ON

<b>HYDRAULIC</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	THE INNER BARRIER "BRIDGE" DIRECTIONAL CONTROL VALVE IS NOT ENERGIZED

<b>MECHANICAL</b>	<b><u>ITEM</u></b>	<b><u>POSSIBLE REASONS FOR FAILURE</u></b>
	1	INNER BARRIER LINKAGE HAS EXCESSIVE WEAR
	2	INNER BARRIER PLATE, HINGE, AND/OR HINGE PINS HAVE EXCESSIVE WEAR





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## Section 8 TROUBLESHOOTING

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**ABOVE STOW LEVEL**

A position of the lift platform when deployed, which is higher than the level at which it will stow.

**ADJUSTABLE RESTRICTOR**

Same as flow control valve.

**ADJUSTABLE RESTRICTOR WITH FREE REVERSE FLOW**

Same as flow control valve with free reverse flow path.

**AERATION**

Air trapped in the hydraulic fluid. Hydraulic components may operate erratically due to the compressibility of air. Aeration may be detected by a milky fluid color.

**ARC**

A luminous discharge of electrons through a gas or vacuum.

**ATMOSPHERE**

Air in any given place. Air is a medium for contamination, as well as a contaminant itself.

**ATMOSPHERIC PRESSURE**

Pressure exerted by the atmosphere in any specific location. At sea level, the pressure is 14.69 psi absolute.

**BACK PRESSURE**

Pressure encountered on the return side (tank) circuit of the hydraulic system. It is also referred to as the pressure of the reservoir.

**BARRIER**

Mechanisms installed at both ends of the lift platform that preclude wheelchair entry and exit from the lift platform while the lift is deployed and in use.

**BEARING BLOCK**

The part that carries the weight of the lift mechanism and reduces friction between the lift mechanism and the slide channels during stow and deploy modes.

**BELOW STOW LEVEL**

A position of the lift platform when deployed, which is at a level lower than at which the lift mechanism will stow.

**BORE, CYLINDER**

The cavity within a cylinder in which a cylinder piston moves.

**BREATHING CAP**

The coarse filter designed to fit as an atmospheric vent on the reservoir.

**BUTT CONNECTOR**

An electrical connector that joins two wires axially (end to end).



**CABLE**

An electrical assembly of one or more conductors, usually within a protective insulation or sheath.

**CAP END, CYLINDER**

A cylinder end closure that completely covers the bore area. Or the end of the cylinder which the cylinder rod does not protrude.

**CAVITATION**

A localized gaseous condition within a liquid that occurs where the pressure is reduced to vapor pressure. In a hydraulic pump, cavitation can be detected by a high-pitched squeal. In a hydraulic cylinder cavitation can cause erratic operation under load.

**CHAIN LIMIT SWITCH**

A short travel limit switch operated by a trip bracket on one of the lift cylinders which senses slack within the lift master chain and therefore defines ground level.

**CHECK VALVE**

A hydraulic device that allows fluid to flow in only one direction. Flow in the reverse manner is prohibited.

**CHECK VALVE, PILOT OPERATED**

A hydraulic valve which allows fluid to flow in one direction or, if actuated by external (pilot) pressure, allows fluid to flow in the opposite direction. Utilized to preclude the hydraulic cylinders from a bleed down condition.

**CIRCUIT**

The interconnection of a number of devices in one or more closed paths to perform a desired electrical or electronic function.

**CIRCUIT BOARD**

A component mounting board composed of a non-conducting material covered on one or both surfaces by a conductive coating. The conductive coating is selectively removed, creating conductive circuit patterns.

**CLOSED-CENTER**

A flow condition within the directional control valve which all ports are blocked at the center (non-activated) position of a three position directional control valve.

**CLOSEOUT**

The component bolted to the curbside end of each of the slide channel assemblies concealing the wear blocks and preventing a path for ice, snow, wind, dust etc. from entering stepwell area with the lift in the stowed position.

**COACH**

A bus.

**COACH FLOOR**

The level of the interior coach flooring. Also, the position of the lift platform at which a lift passenger enters the bus.



### **COMPRESSION FITTING**

A cordgrip which prevents the entry of moisture into a electrical component.

### **CONNECTION DIAGRAM**

A graphical representation of electrical connections between components in an electrical circuit.

### **CONNECTOR**

A device that creates an electrical and mechanical junction between two or more wires or cables.

### **CONTAMINANT**

Any material or substance that is unwanted or adversely affects a fluid power system and/or its components.

### **CORDGRIP**

A device through which a cable enters a junction box or electrical component, relieving strain on internal connections.

### **CROSSMEMBER**

A structural component of the main frame assembly attached to both slide channels, joining an area through which the lift mechanism travels during the stow/deploy modes.

### **CRUTCH**

An adjustable deflection prohibiting component attached to the power platform, which limits deflection of the torque shaft during raise/lower modes.

### **CURBSIDE**

The direction from which one enters a coach or toward the curb.

### **CURRENT**

The movement of electrons through a conductor.

### **CUSHION**

Typically installed at the cap end of a hydraulic cylinder, a cushion valve restrict the cylinder piston movement as it nears the end of the cylinder stroke.

### **CYLINDER**

A device which converts fluid power to a linear mechanical force and motion.

### **DEPLOY**

The operation which moves the lift mechanism from a full and retracted position to an extended position.

### **DEPLOYED LIMIT SWITCH**

A limit switch located on the power platform which senses the lift mechanism in the fully deployed, fully stowed position.

### **DEPLOYED RELAY**

A relay whose signal is controlled by the deployed limit switch.



### **DIODE**

A two terminal electronic device which conducts electricity in one direction.

### **DIRECTIONAL CONTROL VALVE**

A hydraulic device whose function is to direct fluid flow by selectively interconnecting two or more ports within the valve.

### **DIVERTER**

A hydraulic component which directs fluid flow into one or the other of two separate hydraulic systems. Utilized to shift the flow of fluid from the bus-side power steering system to the lift hydraulic system.

### **DRIVE CHAIN, PRIMARY**

A power transmission chain which conveys power from the hydraulic drive motor to the drive (stow) shaft.

### **DRIVE CHAIN, SECONDARY**

A power transmission chain which conveys power from the drive (stow) shaft to the idler assembly allowing the lift mechanism to operate the stow/deploy modes.

### **DRIVE SHAFT**

The solid bar through which power is transmitted from the drive chain (primary) to the stow/deploy (secondary) chain, thereby moving the lift mechanism.

### **FILTER**

A hydraulic device which removes insoluble contaminants by passing fluid through porous media.

### **FILTER ELEMENT**

The media within a filter which retains contaminants.

### **FLOW CONTROL VALVE**

A device which regulates flow rate.

### **FLOW CONTROL VALVE WITH FREE REVERSE FLOW**

A hydraulic device that regulates flow rate in one direction and allows unregulated flow in the opposite direction.

### **FLOW RATE**

The volume of fluid flowing through a component per unit of time, usually measured in gallons per minute (gpm).

### **FORWARD**

Toward the front of the bus.

### **GLAND**

A hydraulic cavity seal.

### **GLAND NUT/BUSHING**

A replaceable cartridge which includes a rod bushing and rod glands. The nut/bushing is threaded into the rod end of the cylinder.



**GROUND**

The voltage reference point in a circuit.

**GROUND LEVEL**

At the nominal level at which the lift platform will rest when the lift platform is fully lowered.

**GUIDE BLOCK**

A wedge-shaped component attached to the lift platform that will position the lift platform within the slide channels when fully stowed.

**HAND PUMP (HYDRAULIC)**

A manually operated device which converts mechanical force and motion into hydraulic fluid power.

**HYDRAULIC FLUID**

The medium for energy transfer in a hydraulic system. It is also a corrosion inhibitor, cleaner, coolant, and lubricant.

**HYDRAULIC MOTOR**

A device which converts fluid power into mechanical energy.

**LIFT ARM**

One of 4 parallel bars which support and move to the lift platform.

**LIFT PLATFORM**

The flat surface on the lift mechanism which a wheelchair is either raised to the coach floor level or lowered to ground level.

**LIFT PLATFORM TRUNNION**

A weldment that links each lift arm (two master arms and two slave arms) to the lift platform.

**LIGHT EMITTING DIODE (LED)**

A diode specifically designed to emit light.

**LIMIT SWITCH**

A mechanically operated device which selectively completes (or breaks) one or more current paths in an electrical circuit.

**LIMIT SWITCH ARM**

A limit switch actuating lever to which a roller is attached.

**LIMIT SWITCH BODY**

The section of a limit switch that contains the switch contacts.

**LIMIT SWITCH HEAD**

The section of a limit switch through which motion is transferred to the body. The limit switch arm is attached to a shaft on the limit switch head.



### **MAIN FRAME**

The supporting structure, mounted to the coach, which encloses the lift mechanism. The main frame consists primarily of slide channels and cross-members.

### **MASTER ARM**

Two of four lift arms that receive motion directly from the lift cylinders to raise and lower the lift platform.

### **MASTER CHAIN**

A power transmission chain through which the linear motion of the lift cylinder rod is transferred to the rotary motion of the master arm.

### **METAL OXIDE VARISTOR (MOV)**

A type of semiconductor that restricts current in a circuit in varying degrees, depending on the voltage applied.

### **MICRON**

One micron is equal to one millionth of a meter or 39 millionths of an inch.

### **MICROMETER**

A device which measures very small dimensions.

### **NORMALLY CLOSED**

A designation applied to switch or relay contacts whose connection is such that the circuit is completed when the switch or relay is not actuated.

### **NORMALLY OPENED**

A designation applied to switch or relay contacts whose connection is such that the circuit is not completed when the switch or relay is not actuated.

### **OPEN-CENTER**

A flow condition within the directional control valve in which Port A and B are open to "T" port when the valve is in the center (Non-actuated) position.

### **ORIFICE RESTRICTOR**

A hydraulic restrictor, which increases restriction due to its small size which alters the hydraulic speed of a particular mode.

### **PISTON**

In a cylinder, the movable component attached to the piston rod separating the ports within the cylinder.

### **PLUG CONNECTOR**

An electrical cable connector which mates to a receptacle connector.

### **POWER**

The rate of doing work.



### **POWER PLATFORM**

The assembly that supports the lift arms, cylinders and associated mechanisms. It also contains the lift mechanism stow and deploy components.

### **PRESSURE**

The measure of a hydraulic force intensity, per unit area, usually measured in pounds per square inch (psi).

### **PRESSURE COMPENSATED FLOW CONTROL VALVE**

A hydraulic valve that controls flow rate independent of system pressure.

### **PRESSURE LINE FILTER**

A filter in a line conducting pressurized fluid to a working device.

### **PRESSURE GAUGE**

A hydraulic instrument used to measure the pressure of a (hydraulic) system.

### **PRESSURE-TEMPERATURE COMPENSATED FLOW CONTROL VALVE**

A valve that controls flow rate independent of system pressure and fluid temperature.

### **PUMP**

Pumps (hydraulic) convert mechanical force and motion into hydraulic fluid power.

### **REAR**

Toward the back of the bus.

### **RECEPTACLE CONNECTOR**

A electrical cable connector which mates to a plug connector.

### **RELAY**

An electrical device which completes or breaks a circuit, as a result of current in another circuit.

### **RELAY, LATCHING**

A type of relay with contacts that lock in either the activated or neutral (not activated) position until an electrical reset is received.

### **RELIEF VALVE**

A hydraulic valve used in hydraulic systems to control the amount of hydraulic system pressure. Relief valves are available in pre-set or adjustable models.

### **RESERVOIR**

A container for storage of liquid in a fluid power system. The reservoir provides for fluid cooling, and sedimentation of particles.

### **RESISTOR**

An electrical component which restricts the amount of current in a circuit, or provides a voltage drop.





### **RESTRICTOR**

A hydraulic device that alters the hydraulic flow rate and thus affects the speed of a particular hydraulic operation.

### **RING TERMINAL**

An electrical device attached to a conductor to facilitate connection to another conductor.

### **ROADSIDE**

The driver's side of the coach or the side closest to the center of the road.

### **ROD, CYLINDER**

The cylinder rod connects the cylinder piston to the mechanical load.

### **ROD BUSHING**

A bearing in the cylinder head which maintains the cylinder rod parallel within the cylinder bore.

### **ROD END**

The end of the hydraulic cylinder from which the cylinder rod protrudes.

### **SEALS**

Hydraulic devices to keep contaminants out of a hydraulic system and/or to keep fluid in a system.

### **SENSITIVE EDGE**

A ribbon-type contact sensing switch, located on the front and rear sides of the lift platform. Electrically connected such that lift action stops when anything presses against the switch.

### **SLAVE ARM**

Two arms which receive power from the master arms.

### **SLAVE CHAIN**

A power transmission chain which transfers power or motion from the lift master arms to the slave arms.

### **SLIDE CHANNEL**

One of two stationary channel members inside of which the bearing blocks travel during the stow/deploy modes. The slide channels also restrains the lift mechanism from vertical movement while in the stowed position.

### **SOLENOID OPERATOR**

An electrical actuator operated by electrical current passing through a coil.

### **SOLID STATE SOURCE DRIVER**

A silicone electrical device that provides a circuit voltage to another circuit.

### **SPOOL**

The component in a hydraulic valve that controls the flow of fluid direction from one port to another port.

### **SPRING RETURN**

A method for returning a hydraulic valve spool to its normal position.



**STOW**

The operation which moves the lift mechanism from an extended to a retracted position.

**STOW LATCH**

A mechanism which secures the lift mechanism in the stowed position.

**STOW LEVEL**

That level of the lift platform such that the lift mechanism retracts into the slide channels.

**STROKE**

The maximum amount of distance a cylinder piston can move within a cylinder bore.

**STRONG ARM**

An extension of the power platform structure to which the master and slave arms are attached, providing support to both.

**STRONG ARM TRUNNION**

A cylindrical attachment point on the strong arm for the slave arms.

**SYSTEM PRESSURE, (Hydraulic)**

The hydraulic pressure which overcomes and is greater than the total resistance in a system.

**TERMINAL STRIP**

An electrical attachment device with an insulating base equipped with connection points for electrical conductors.

**TERMINAL STRIP JUMPER**

An electrical conductor which provides a continuous circuit between two electrical circuits.

**TORQUE SHAFT COUPLING**

The component that couples the two lift master arms together.

**TRUNNION**

A cylindrical attachment and pivot point which supports and provides an axis for rotation of an attached part.

**VALVE**

A hydraulic device to control fluid direction, pressure, or flow rate.

**VALVE ACTUATOR**

The hydraulic valve part(s) through which force (electrical or mechanical) force is applied to move or direct the hydraulic flow.

**VARIABLE ORIFICE**

Same as flow control valve.



### **VELOCITY**

The change of position in a specified direction per a unit of measure.

### **VISCOSITY**

A measure of the internal friction, or the resistance of a hydraulic fluid to flow.

### **VISCOSITY INDEX**

A measure of the viscosity-temperature characteristics of a hydraulic fluid as compared to that a reference fluid.

### **VOLTAGE DROP**

The difference in voltage between two points in a circuit due to resistance.

### **VOLTAGE SURGE**

A large sudden change of voltage, usually caused by the collapse of a magnetic field, or by a shorted or open circuit element.

### **VOLUME**

A three dimensional measurement of size.

### **WEAR BLOCK**

A brass ramp which, in conjunction with the guide block, position the lift platform within the slide channels as the lift mechanism stows.

### **WIRE JOINT**

An electrical connector that joins the ends of two or more wires radially (side by side).

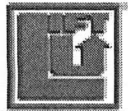
# **Service Parts Assemblies**



LIFT-U®  
Division of  
Hogan Mfg., Inc.

## ILLUSTRATED PARTS INDEX

<u>Part Number</u>	<u>Drawing Description</u>
180-L351	LU10 LIFT PACKAGE
LU10-61-01	LIFT MODEL
D34-4725	SPLASH SHIELD ASSY, R/S (SST)
D34-4730	SPLASH SHIELD ASSY, C/S (SST)
123-1004	ROD END ASSY
181-0087	MAIN FRAME ASSY
182-0071	STOW LATCH ASSY
183-0118	LIFT PLATFORM ASSY
184-0109	RAMP BARRIER ASSY
184-0110	RAMP BARRIER LINKAGE
184-0114	BRIDGE/BARRIER ASSY
185-0165	POWER PLATFORM ASSY
D54-0758	IDLER ASSY
D54-0836	SLAVE CHAIN ASSY
186-0064	CRUTCH ASSY
187-0151	MASTER ARM ASSY, FWD
187-0152	MASTER ARM ASSY, REAR
187-0153	SLAVE ARM ASSY
D55-8427	STOW/DEPLOY CHAIN ASSY
D55-0962	HOSE BUNDLE SPRING/CLAMP KIT
188-0146	POWER HARNESS, LP/PP
188-0148	POWER HARNESS, PP/BHD
188-0151	POWER HARNESS, CONTROL/BHD
189-0239	LIFT ASSY
199-0061	LIFT OPERATION/ENVELOPE
D62-4650	BANKABLE VALVE ASSY, 24V
D62-8210	STOW LATCH CYL ASSY
272-0087	DRIVE MOTOR ASSY
272-0088	LIFT CYL ASSY, FWD
272-0089	LIFT CYL ASSY, REAR
273-0066	RAMP CYL ASSY
273-0067	BRIDGE CYL ASSY
273-0068	GAS SPRING ASSY
D80-1483	HYD POWER UNIT ASSY, 24V
274-0206	POWER/CONTROL ASSY, 24V



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## ILLUSTRATED PARTS INDEX

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D80-0614	MANIFOLD ASSY, LINKAGE
275-0242	VALVE ASSY, 24V
291-0102	LU10 HYD SYSTEM DIAGRAM, 24V
293-0106	LU10 HYD INTERCONNECT, 24V
392-0020	LU10 ELECTRICAL SYSTEM DIAGRAM, 24V (BUS-SIDE)
393-0183	LU10 ELECTRICAL INTERCONNECT, 24V



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TITLE

LU10 LIFT PACKAGE

DOC NO

180-L351

REV

B

FIRST USE

ORDON V; ALEXANDRIA, VA.

SHT

1 /1

<u>PART NO</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
LU10-61-01	1	LIFT MODEL	
D34-4725	1	SPLASH SHIELD ASSY, R/S (SST)	
D34-4730	1	SPLASH SHIELD ASSY, C/S (SST)	
123-0607	1	STEP TREAD (MACHINE PER 123-0976)	"RCA" 627 WALNUT BROWN W /YELLOW NOSE
125-0349	1	HANDRAIL WELDMENT, FWD (SST)	SST - NO PAINT
125-0350	1	HANDRAIL WELDMENT, REAR (SST)	SST - NO PAINT
188-0154	1	HARDWARE KIT	

B	____	BSA	11-8-04	FINALIZED HARDWARE KIT - ADDED 188-0154	BSA	11-8-04	BSA	11-8-04
A	____	BSA	10-21-04	RELEASED	BSA	10-21-04	BSA	10-21-04
REV	ECO	APPD	DATE	DESCRIPTION	DFTR	DATE	CHKR	DATE

## LIFT APPLICATION

COACH MFR/MODEL: ORDN V  
COACH WIDTH: 96"/102"  
COACH LENGTH: 35'/40'  
LIFT LOCATION: FRONT/REAR DOOR

## LIFT FEATURES

ELECTRICAL VOLTAGE: 24 VDC  
CONTROL LOGIC (AUTO/SEP FUNC): SEPERATE DEPLOY  
STW/DEP SW ORIENTATION (F/R): REAR  
HYDRAULIC POWER SOURCE: ELEC PUMP  
HYDRAULIC FLUID: AVIATION TYPE "A"  
NOMINAL HOSE/HARNESS LENGTH: 11'/15'  
SPLASH SHIELD: TWO-PIECE HINGED  
HANDRAIL: SEE LIFT PACKAGE  
STEP TREAD: SEE LIFT PACKAGE  
OTHER: BULKHEAD FITTINGS  
SST LIFT PLATFORM

## DIMENSIONAL SPECIFICATIONS

LIFT PLATFORM WIDTH: 32.13" USEABLE  
LIFT PLATFORM LENGTH: 55.83" OVERALL  
HANDRAIL CLEAR WIDTH: 34.13"  
RAMP BARRIER HEIGHT: 15.00"  
BRIDGE BARRIER HEIGHT: 5.88"  
SIDE CURB HEIGHT: 2.00"  
LIFT ARM LENGTH: 20.465"  
TRUNNION CENTERS: 25.50"  
FRAME WIDTH: 43.25"  
FRAME LENGTH: 88.38"

TITLE LIFT MODEL

DOC NO LU10-61-01

REV B

## REVISIONS

LTR	ECO	APPD	DATE	DESCRIPTION	DFTR	DATE	CHKR
B				UPDATED NOTES	BSA	9-29-04	BSA

\*\*NOTE: THESE ITEMS ARE TEMPORARY FOR SHIPPING ONLY

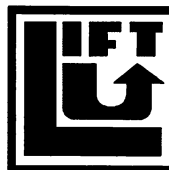
393-0183	N/A	ELECTRICAL INTERCONNECT	(REF)
392-0020	N/A	ELECTRICAL SYSTEM DIAGRAM, 24V	(REF)

293-0106	N/A	HYDRAULIC INTERCONNECT	(REF)
291-0102	N/A	HYDRAULIC SYSTEM DIAGRAM	(REF)
199-0061	N/A	LIFT OPERATION / ENVELOPE	(REF)

231-1601	6	STEEL CAP; 37° FJIC, -6, PLD	**
231-2601	4	STEEL PLUG; HEX HD, 37° MJIC, -6, PLD	**
231-1401	2	STEEL CAP; 37° FJIC, -4, PLD	**
231-2401	4	STEEL PLUG; HEX HD, 37° MJIC, -4, PLD	**

102-0093	1	INSTRUCTION LABEL, MANUAL CONTROL OPERATION
437-0053	3	LOOP CLAMP; VINYL COATED, 2 1/2" DIA, 3/8" STUD
373-0263	1	THRESHOLD SENSOR ASSEMBLY
D55-0962	1	HOSE BUNDLE SPRING / CLAMP KIT
274-0206	1	POWER / CONTROL ASSEMBLY, 24V
189-0239	1	LIFT ASSEMBLY

PART NO.	QTY	DESCRIPTION
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LIFT-U

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TITLE

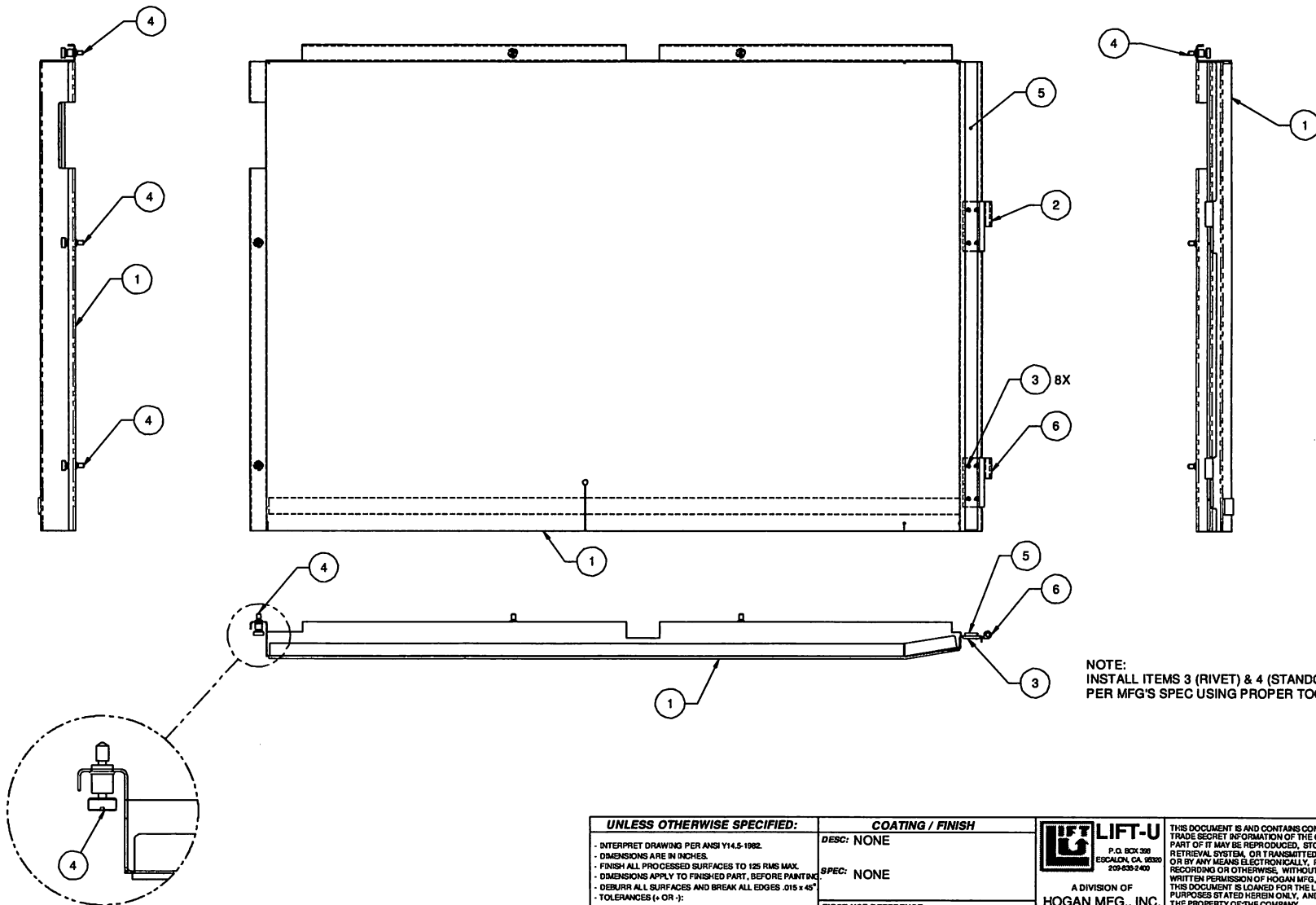
LIFT MODEL

DOC NO


LU10-61-01

REV B



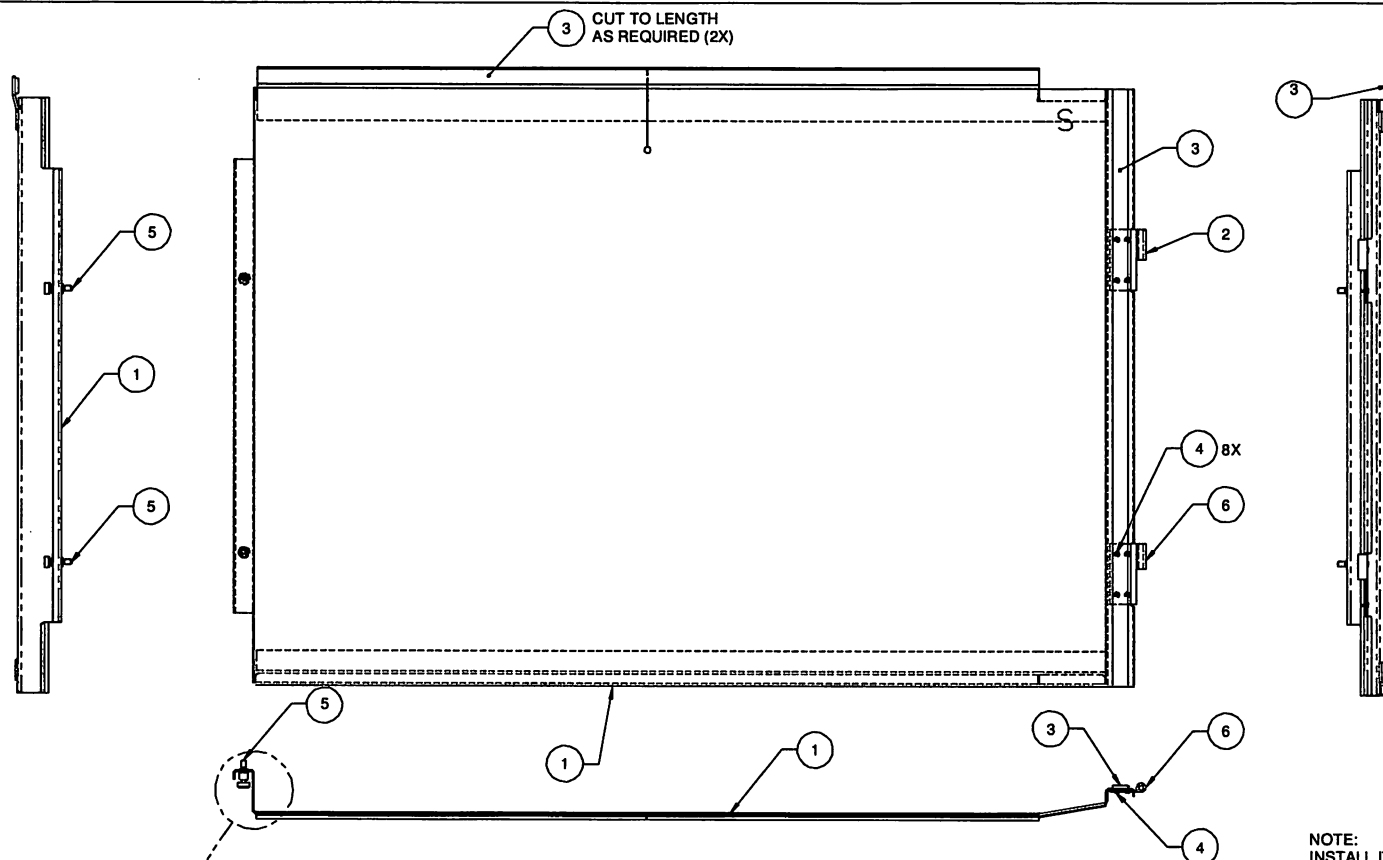


NOTE:  
INSTALL ITEMS 3 (RIVET) & 4 (STANDOFF)  
PER MFG'S SPEC USING PROPER TOOLS.

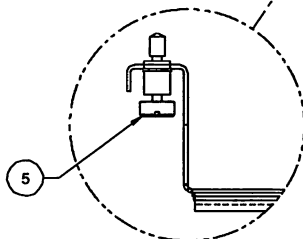
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DECIMAL: .XX = .03 .XXX = .010 .XXXX = .0005	FRACTION: 1/16  ANGLE: 1/2 DEGREE	SCALE: 1:3	WEIGHT: (LBS) 23.64
 P.O. BOX 308 ESCALON, CA. 95320 209-535-2400  A DIVISION OF <b>HOGAN MFG., INC.</b>		THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG, INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
TITLE		DOCUMENT NO.	
SPLASH SHIELD ASSY, R/S (SST)		D34-4725	
SHEET NO.		REVISION	
1 OF 1		D	


Part Number	Revision	Description
D34-4725	D	SPLASH SHIELD ASSY, R/S (SST)

ITEM	QTY	P/N	DESCRIPTION
1	1	114-0121	SPLASH SHIELD WELDMENT, R/S (SST)
2	1	114-0066	SPLASH SHIELD HINGE, FEMALE
3	8	440-0022	SST BLIND RIVET
4	4	415-9014	CAPTIVE SCREW
5	1	103-0023	RUBBER SPONGE STRIP; ADH-BACKED, 3/16 X 3/4 <REPLA
6	1	114-0080	SPLASH SHIELD HINGE, FEMALE



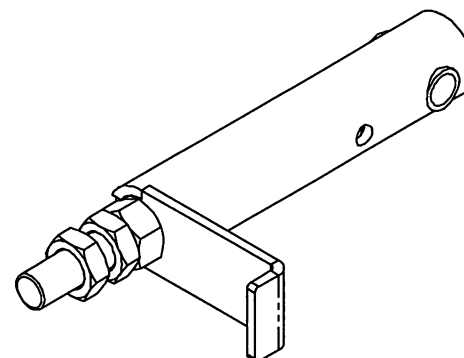
NOTE:  
INSTALL ITEMS 3 (RIVET) & 4 (STANDOFF)  
PER MFG'S SPEC USING PROPER TOOLS.




<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>		 <b>LIFT-U</b> P.O. BOX 398 ESCALON, CA 95320 209-539-2400  A DIVISION OF <b>HOGAN MFG., INC.</b>	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.
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		FIRST USE REFERENCE:  9065			
		SCALE: 1:3	WEIGHT: (LBS) 29.20	DOCUMENT NO. D34-4730	SHEET NO. 1 OF 1 REVISION

Part Number	Revision	Description
D34-4730	D	SPLASH SHIELD ASSY, C/S (SST)

ITEM	QTY	P/N	DESCRIPTION
1	1	114-0122	SPLASH SHIELD WELDMENT, C/S (SST)
2	1	114-0066	SPLASH SHIELD HINGE, FEMALE
3	8	440-0022	SST BLIND RIVET
4	2	415-9014	CAPTIVE SCREW
5	1	103-0023	RUBBER SPONGE STRIP; ADH-BACKED, 3/16 X 3/4 <REPLA
6	1	114-0080	SPLASH SHIELD HINGE, FEMALE

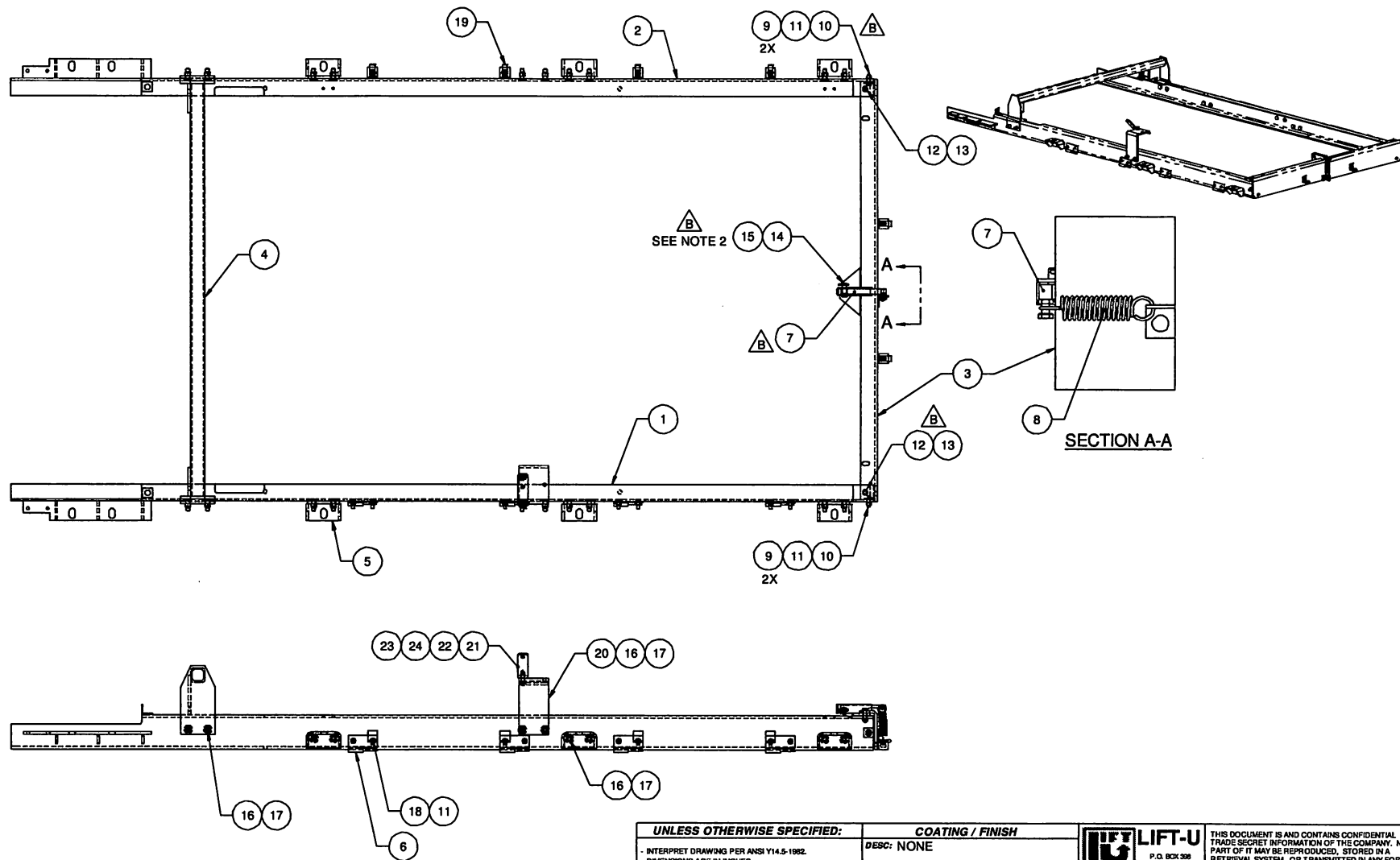


**NOTE:**  
**APPLY COMMERCIAL ANTI-SEIZE (P/N 515-0007)**  
**TO ITEM 4 PRIOR TO ASSEMBLY.**

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		<b>FIRST USE REFERENCE:</b> 273-0067		<b>TITLE</b> <b>ROD END ASSEMBLY</b>			
		<b>SCALE:</b> 1.5:1 <b>WEIGHT:</b> 0.9447 (LBS.)		<b>DOCUMENT NO.</b> 123-1004		<b>SHEET NO.</b> 1 OF 1 <b>REVISION</b> B	

**Part Number**      **Revision**      **Description**  
**123-1004**            **B**            **ROD END ASSEMBLY**

ITEM	QTY	P/N	DESCRIPTION
1	1	123-1005	ROD END WELDMENT
2	1	D45-1459	SLEEVE BEARING
3	2	D48-3797	COMPRESSION SPRING
4	1	123-0984	SPRING POST
5	1	123-0995	SPRING SHOULDER
6	1	423-9751	NYL INSR LOCKNUT, LT
7	1	422-9702	HEX NUT, SST
8	2	422-9701	HEX JAM NUT, SST



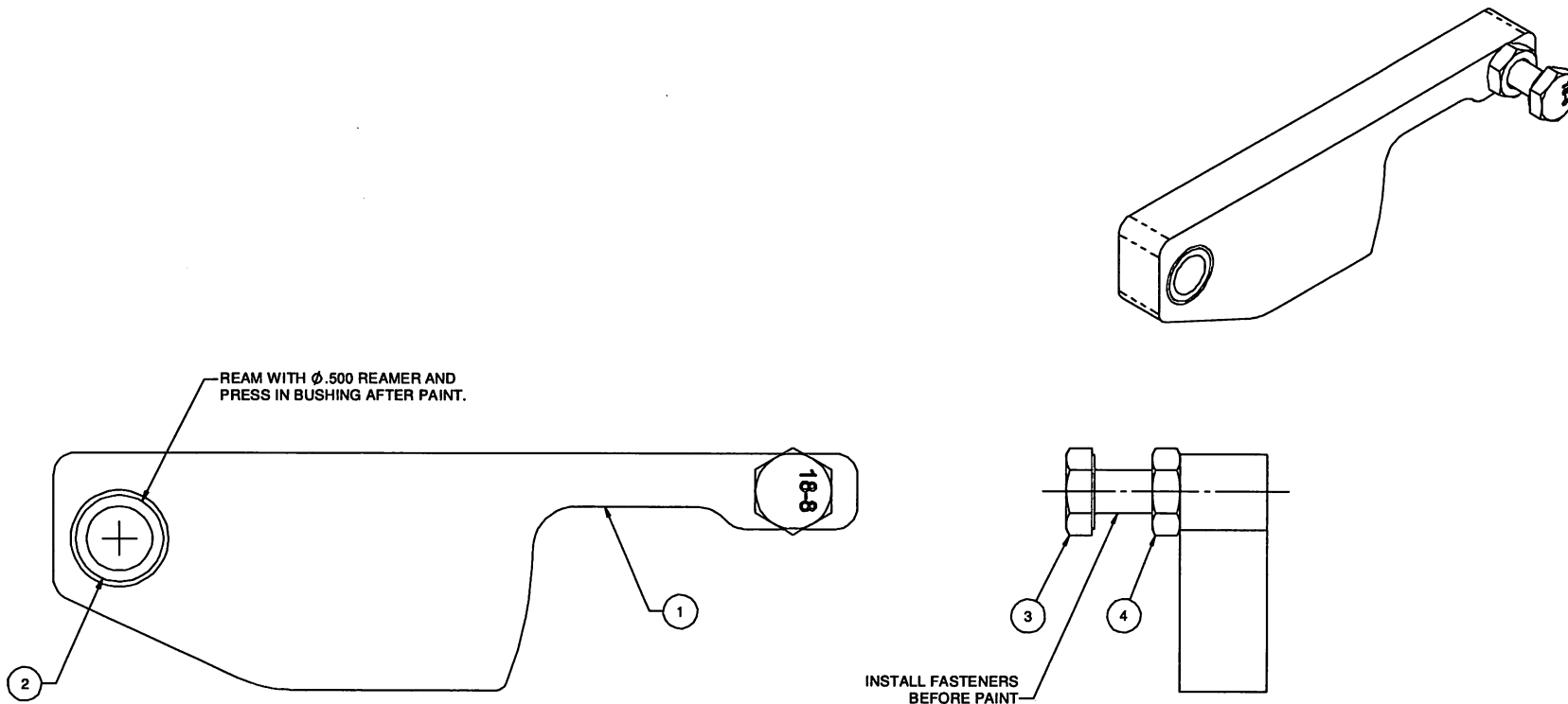
- NOTES:**
1. TORQUE ALL FASTENERS PER LIFT-U SPEC X531-0002.
  2. USE ANTI-CORROSION LUBRICANT (LIFT-U P/N 515-0007) ON ITEM 14 BEFORE ASSEMBLY.
  3. APPLY COMMERCIAL ANTI-SEIZE (P/N 515-0007) TO ALL SST FASTENERS.


UNLESS OTHERWISE SPECIFIED:		COATING / FINISH	
<ul style="list-style-type: none"> <li>INTERPRET DRAWING PER ANSI Y14.5-1982.</li> <li>DIMENSIONS ARE IN INCHES.</li> <li>FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.</li> <li>DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.</li> <li>DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45°</li> <li>TOLERANCES (+ OR -):</li> </ul>		<p>DESC: NONE</p> <p>SPEC: NONE</p>	
<p>FIRST USE REFERENCE:</p> <p>189-0239</p>		<p>SCALE: 1:5</p> <p>WEIGHT: 118.3078 (LBS)</p>	
<p>DECIMAL: .03 .010 .0005</p> <p>FRACTION: 1/16</p> <p>ANGLE: 1/2 DEGREE</p>		<p><b>LIFT-U</b></p> <p>P.O. BOX 308 ESCALON, CA 92329 209-826-2400</p> <p>A DIVISION OF <b>HOGAN MFG., INC.</b></p> <p>TITLE <b>MAIN FRAME ASSEMBLY</b></p> <p>DOCUMENT NO. 181-0087</p>	
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		<p>SHEET NO. 1 OF 1</p> <p>REVISION B</p>	

Part Number	Revision	Description
181-0087	B	MAIN FRAME ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	D33-9805	SLIDE CHANNEL WELDMENT, FORWARD
2	1	D33-9822	SLIDE CHANNEL WELDMENT, REAR
3	1	D33-7064	CROSSMEMBER WELDMENT, ROADSIDE
4	1	D33-8722	CROSSMEMBER WELDMENT, C/S
5	6	D34-4373	FRAME MOUNT WELDMENT
6	4	D34-6104	SPLASH SHIELD HINGE, MALE
7	1	182-0071	STOW LATCH ASSY
8	1	D48-4431	EXTENSION SPRING
9	2	426-9104	SAE WASHER, SST
10	2	411-9408	HEX HD CAP SCREW,SST
11	10	423-9452	NYL INSR LOCKNUT, LT, SST
12	2	411-9510	HEX HD CAP SCREW,SST
13	2	423-9751	NYL INSR LOCKNUT, LT
14	1	434-1618	CLEVIS PIN, SST
15	1	434-2205	COTTER PIN
16	20	413-2610	HEX SOC FLAT HD CAP SCREW
17	20	423-2603	NYL INSR LOCKNUT, LT, YEL. ZINC PLD.
18	8	413-9408	HEX SOC FLAT HD CAP SCREW, SST.
19	6	424-4451	CLIP NUT <REPLACES 424-2401, -2451>
20	1	D34-5972	BUNDLE SUPPORT
21	1	D34-5558	SWIVEL PLATE
22	1	416-9504	HEX SOC HD SHOULDER SCREW, SST
23	1	426-9105	SAE WASHER, SST
24	1	423-9451	NYL INSR LOCKNUT, LT

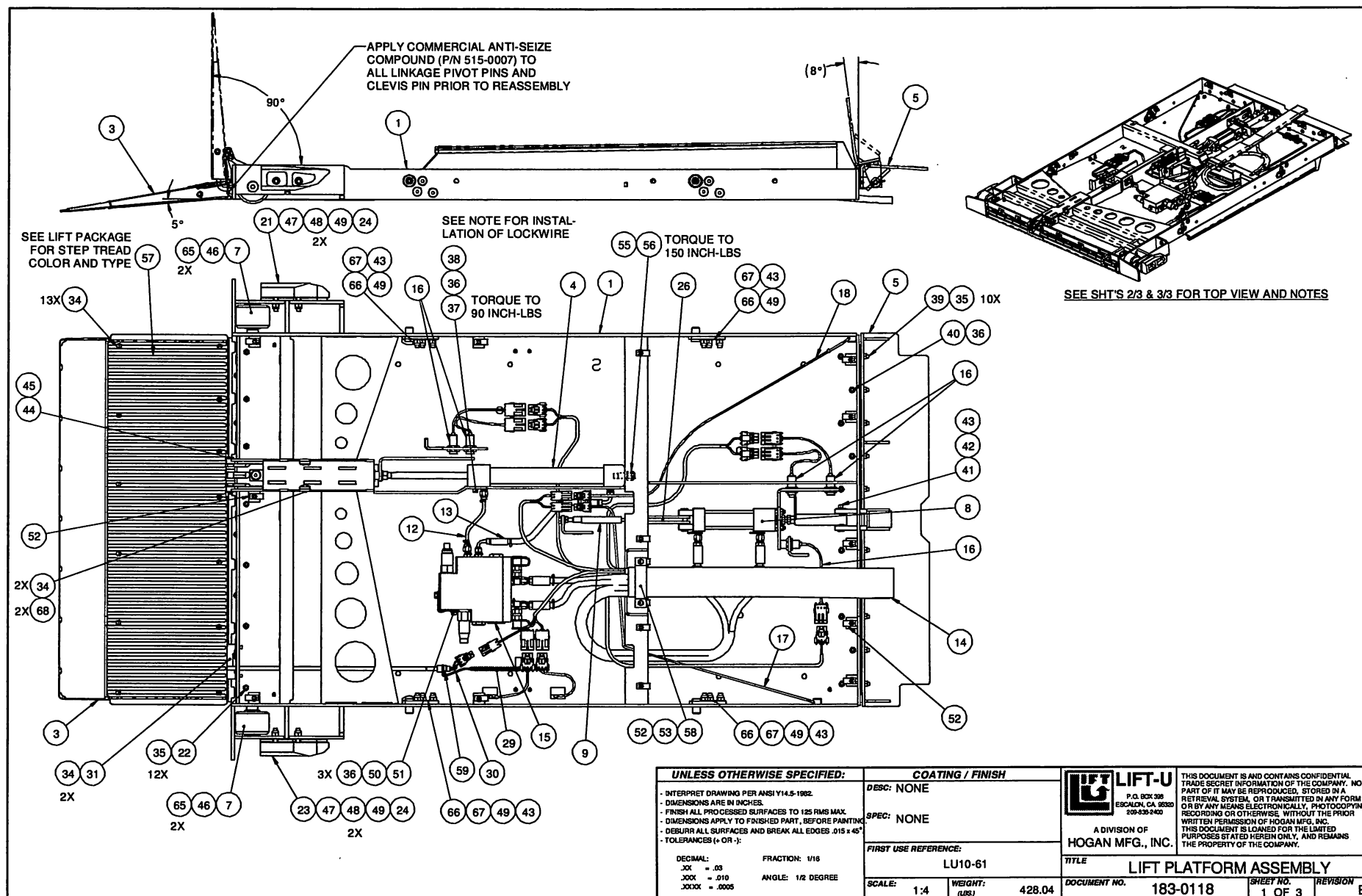


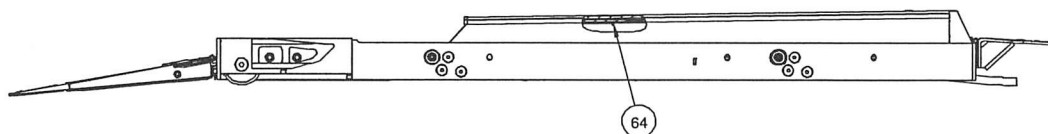
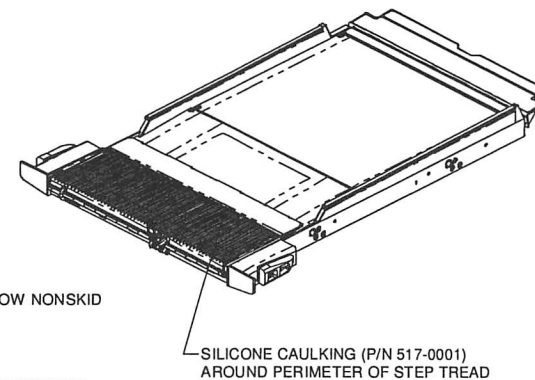
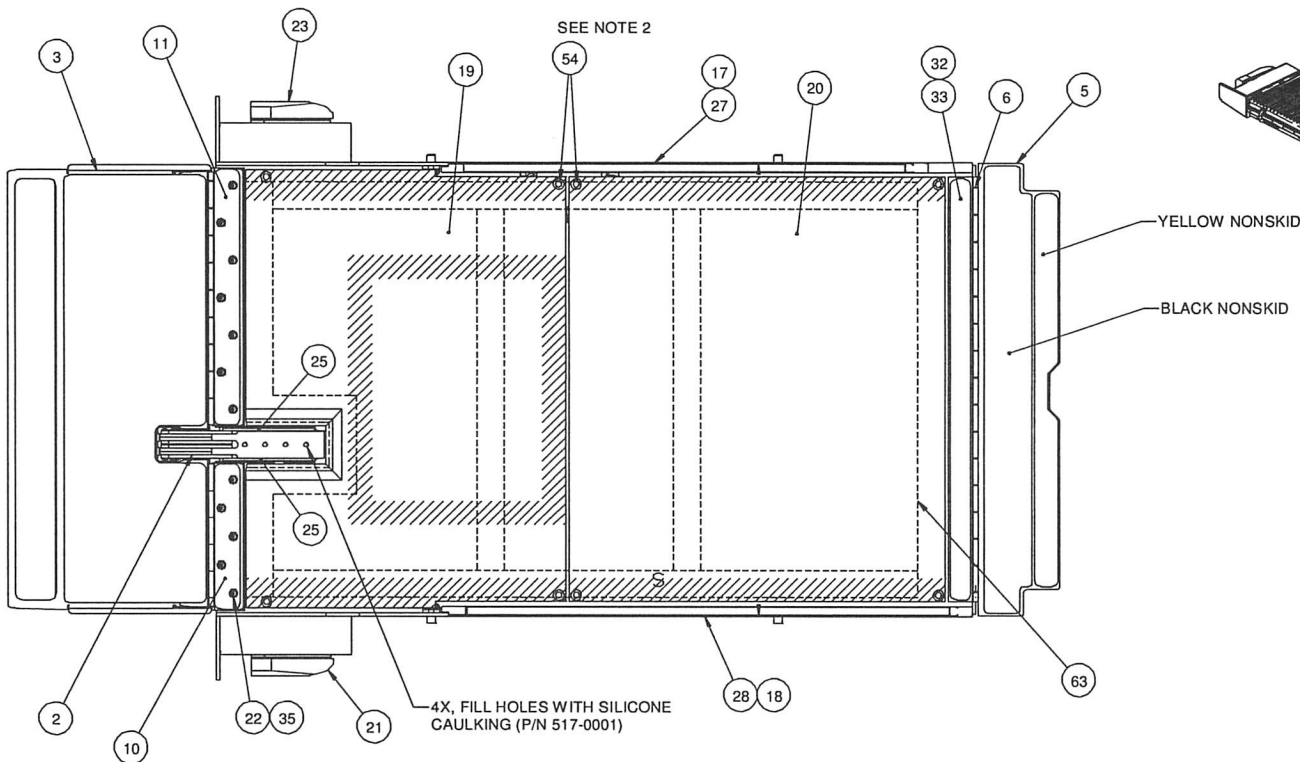


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		<b>FIRST USE REFERENCE:</b>  			

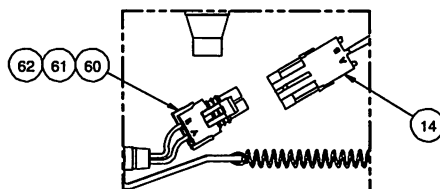
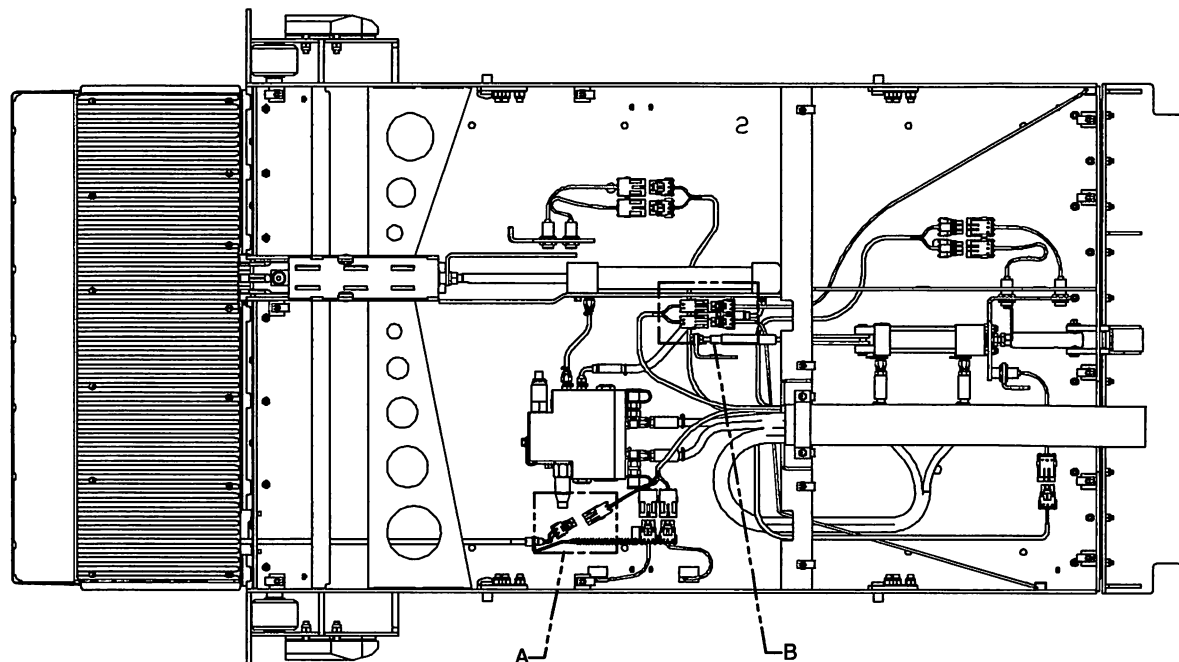
Part Number	Revision	Description
182-0071	B	STOW LATCH ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	D33-5602	STOW LATCH
2	1	D45-1422	SLEEVE BEARING <REPLACES 153-0061>
3	1	411-9408	HEX HD CAP SCREW,SST
4	1	422-9453	HEX JAM NUT

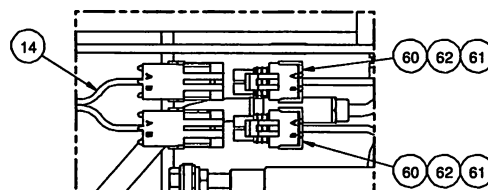




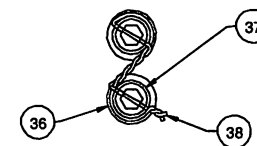
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	A DIVISION OF <b>HOGAN MFG., INC.</b>	
<b>TITLE</b> LIFT PLATFORM ASSEMBLY		
<b>DOCUMENT NO.</b> 183-0118	<b>SHEET NO.</b> 2 OF 3	<b>REVISION</b> B



DETAIL A



DETAIL B




#### NOTES:

1. INSTALL ITEM 47 WITH LOCTITE, BLUE (P/N 516-0010).
2. MATCH MARK AND DRILL PLATFORM PLATE WITH THE SENSITIVE MAT ASSYS (ITEMS 19 & 20) USING LETTER "A" DRILL ( $\phi$ .234).
3. CAULK ALL SENSITIVE MAT PERIMETERS & WIRE HOLES WITH SILICONE CAULKING (P/N 517-0001).
4. CAP OR PLUG ALL OPEN HYDRAULIC FITTINGS FOR SHIPPING AND/OR STORAGE.
5. TORQUE PROCEDURES ARE AS FOLLOWS:  
FASTENERS PER LIFT-U SPEC 531-0002  
FITTINGS PER LIFT-U SPEC 531-0003
6. ITEM 16 INCLUDES TWO JAM NUTS EACH.
7. APPLY COMMERCIAL ANTI-SEIZE COMPOUND (P/N 515-0007) TO ALL SST FASTENERS.
8. APPLY ANTI-CORROSION LUBRICANT (P/N 515-0006) TO BOTH CLEVIS PINS OF THE BRIDGE/BARRIER CYLINDER.

#### INSTALLATION OF LOCK WIRE:

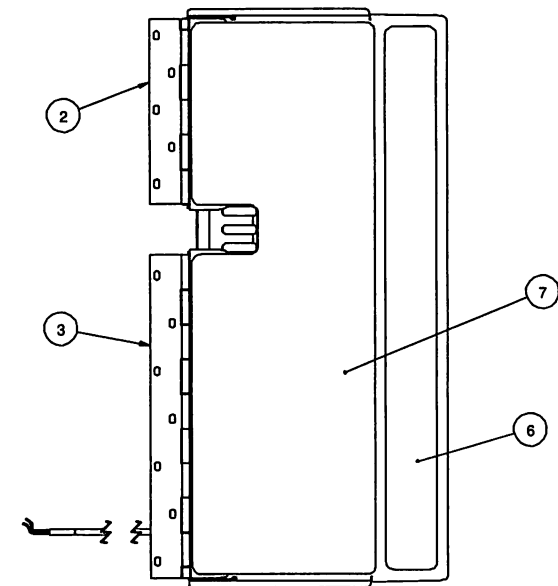
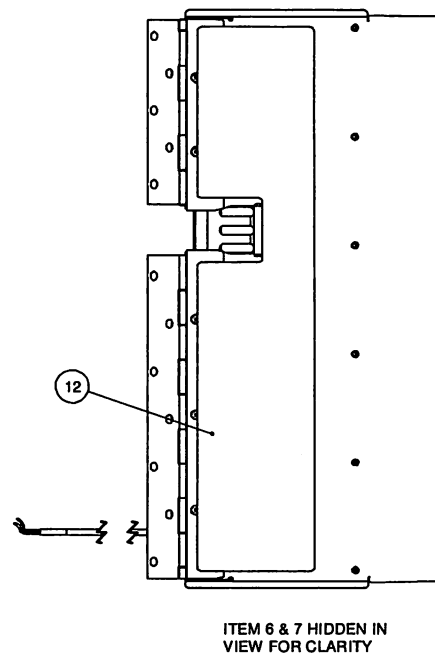
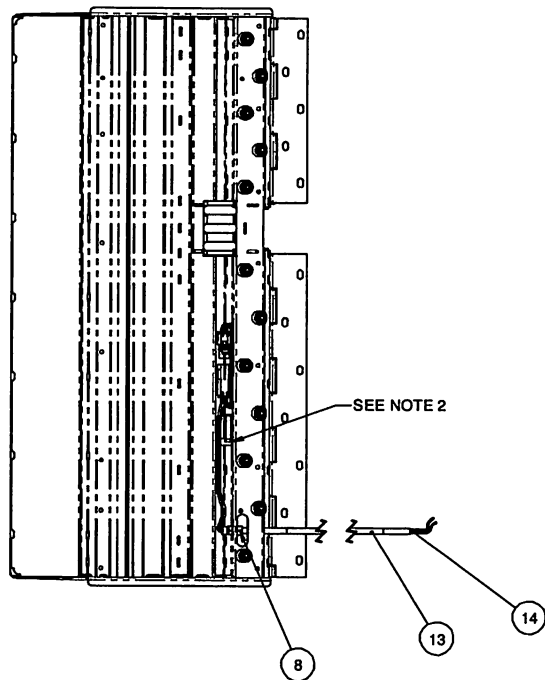
1. THE DOUBLE TWIST METHOD OF LOCK-WIRING SHALL BE USED. SEE DETAIL.
2. THE SAFETY WIRE SHALL BE INSTALLED SUCH THAT THE WIRE TENSION TENDS TO TIGHTEN THE BOLT, SCREW, ETC., I.e.: TENDENCY OF BOLTS OR SCREWS TO LOOSEN WILL PLACE WIRE IN TENSION.
3. THE SAFETY WIRE IS TO BE INSTALLED AND TWISTED SO THAT THE LOOP AROUND THE HEAD STAYS DOWN AND DOES NOT TEND TO COME UP OVER THE BOLT HEAD AND LEAVE A SLACK LOOP.
4. SAFETY WIRE SHALL BE PULLED TAUT WHILE BEING TWISTED. INSURE THAT IT IS TIGHT, BUT NOT OVERSTRESSED. AS A GUIDELINE, 7 TO 10 TWISTS PER INCH ARE RECOMMENDED FOR .032 DIAMETER WIRE.
5. A PIGTAIL OF 1/4 TO 1/2 INCH (THREE TO SIX TWISTS) SHALL BE MADE AT THE END OF THE WIRING. THE PIGTAIL SHALL BE BENT BACK TO PREVENT IT FROM BECOMING A SNAG.
6. SAFETY WIRE SHALL BE NEW UPON EACH APPLICATION.

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	A DIVISION OF <b>HOGAN MFG., INC.</b>	
<b>TITLE</b> LIFT PLATFORM ASSEMBLY		
<b>DOCUMENT NO.</b> 183-0118	<b>SHEET NO.</b> 3 OF 3	<b>REVISION</b> B

Part Number	Revision	Description
183-0118	B	LIFT PLATFORM ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	121-0774	LIFT PLATFORM WELDMENT (SST)
2	1	184-0110	RAMP BARRIER LINKAGE ASSEMBLY
3	1	184-0109	RAMP BARRIER ASSEMBLY
4	1	273-0066	RAMP CYLINDER ASSEMBLY
5	1	184-0114	BRIDGE/BARRIER ASSEMBLY (SST)
6	1	D36-6260	BRIDGE HINGE
7	2	D47-9928	WHEEL ASSY
8	1	273-0067	BRIDGE CYLINDER ASSEMBLY
9	1	273-0068	GAS SPRING ASSEMBLY
10	1	123-0962	RAMP HINGE CLAMP BAR ASSY, FWD
11	1	123-0963	RAMP HINGE CLAMP BAR ASSY, REAR
12	1	225-0171	HYD TUBING ASSY, YELLOW
13	1	221-0653	HYD HOSE ASSY, GREEN
14	1	188-0146	POWER HARNESS, LP/PP
15	1	D80-0614	MANIFOLD ASSY, LINKAGE
16	5	D10-2495	PROXIMITY SWITCH ASSY
17	1	312-0015	SENSITIVE EDGE SWITCH, 32 1/2"L
18	1	312-0009	SENSITIVE EDGE SWITCH, 35 1/2"
19	1	373-0259	SENSITIVE MAT ASSY, CURBSIDE
20	1	373-0262	SENSITIVE MAT ASSY, ROADSIDE
21	1	D36-4706	STOW GUIDE, FORWARD
22	12	413-9408	HEX SOC FLAT HD CAP SCREW, SST.
23	1	D36-4712	STOW GUIDE, REAR
24	2	D36-6768	STOW GUIDE SHIM, 1/4"
25	2	123-0968	LINKAGE CLOSEOUT
26	1	123-1016	CLEVIS PIN SUPPORT
27	1	D14-0696	SENSITIVE EDGE MOUNTING RAIL
28	1	D10-4794	SENSITIVE EDGE MOUNTING RAIL
29	1	D46-6702	EXTENSION SPRING, SST
30	1	123-0966	SPRING CONNECTOR
31	1	123-0967	HOSE BEND PROTECTOR
32	1	123-0964	BRIDGE HINGE CLAMP BAR
33	1	123-0965	SAFETY WALK, BRIDGE
34	17	440-0002	SST BLIND RIVET <REPLACES 440-0010>
35	22	423-9452	NYL INSR LOCKNUT, LT, SST

ITEM	QTY	P/N	DESCRIPTION
36	15	427-0204	HLCL SPR LOCKWASHER
37	2	412-9018	HEX SOC HD CAP SCREW, SST, CROSS DRILLED HEAD
38	12	434-2101	MONEL WIRE
39	10	412-9456	HEX SOC HD CAP SCREW
40	10	412-9455	HEX SOC HD CAP SCREW, SST
41	1	434-1620	CLEVIS PIN, SST
42	1	434-2204	COTTER PIN, SST
43	13	426-9106	SAE WASHER, SST <REPLACES 426-2122>
44	1	D12-4919	CLEVIS PIN, SST
45	1	434-2205	COTTER PIN
46	2	413-9824	HEX SOC FLAT HD CAP SCREW, SST
47	4	412-9612	HEX SOC HD CAP SCREW, SST
48	2	D36-6714	STOW GUIDE SHIM
49	16	423-8651	NYL INSR LOCKNUT, LT, SST
50	3	426-9104	SAE WASHER, SST
51	3	411-9456	HEX HD CAP SCREW, SST
52	16	424-4451	CLIP NUT <REPLACES 424-2401, -2451>
53	2	411-9458	HEX HD CAP SCREW
54	8	417-0096	RETAINER
55	1	123-0990	THREADED STUD
56	1	423-9801	NYL INSR LOCKNUT, LT
57	1	123-0976	STEP TREAD, 32" MACHINED
58	1	D36-6205	HOSE/CABLE CLAMP
59	1	230-0039	COMPRESSION FITTING
60	3	332-0098	CONNECTOR TOWER, 2-WAY
61	6	332-0148	CABLE SEAL, RED
62	6	332-0170	CONTACT SOCKET; 20-18 AWG, STAMPED & FORMED
63	264	516-0013	TWO-SIDED TAPE; 2" WIDE
64	10	440-0022	SST BLIND RIVET
65	4	426-9110	SAE WASHER, SST
66	4	123-0994	TRUNNION WELDMENT
67	12	413-9810	HEX SOC FLAT HD CAP SCREW, SST.
68	2	429-0078	TEFLON WASHER



**NOTES:**

1. APPLY COMMERCIAL ANTI-SEIZE COMPOUND (P/N 515-0007) TO ITEM 11 PRIOR TO ASSEMBLY.
2. SEAL OPENING WHERE MEMBRANE SWITCH PASSES THROUGH RAMP BARRIER WELDMENT WITH SILICONE CAULKING (P/N 517-0001).

**UNLESS OTHERWISE SPECIFIED:**

- INTERPRET DRAWING PER ANSI Y14.5-1982.
- DIMENSIONS ARE IN INCHES.
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45°
- TOLERANCES (+ OR -):

DECIMAL: FRACTION: 1/16  
 .XX = .03  
 .XXX = .010  
 .XXXX = .0005  
 ANGLE: 1/2 DEGREE

**COATING / FINISH**

DESC: NONE

SPEC: NONE

**FIRST USE REFERENCE:**

183-0114

SCALE: 1:3.5

WEIGHT: (LBS)

0.00



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**HOGAN MFG., INC.**

TITLE  
**RAMP BARRIER ASSEMBLY**

DOCUMENT NO.

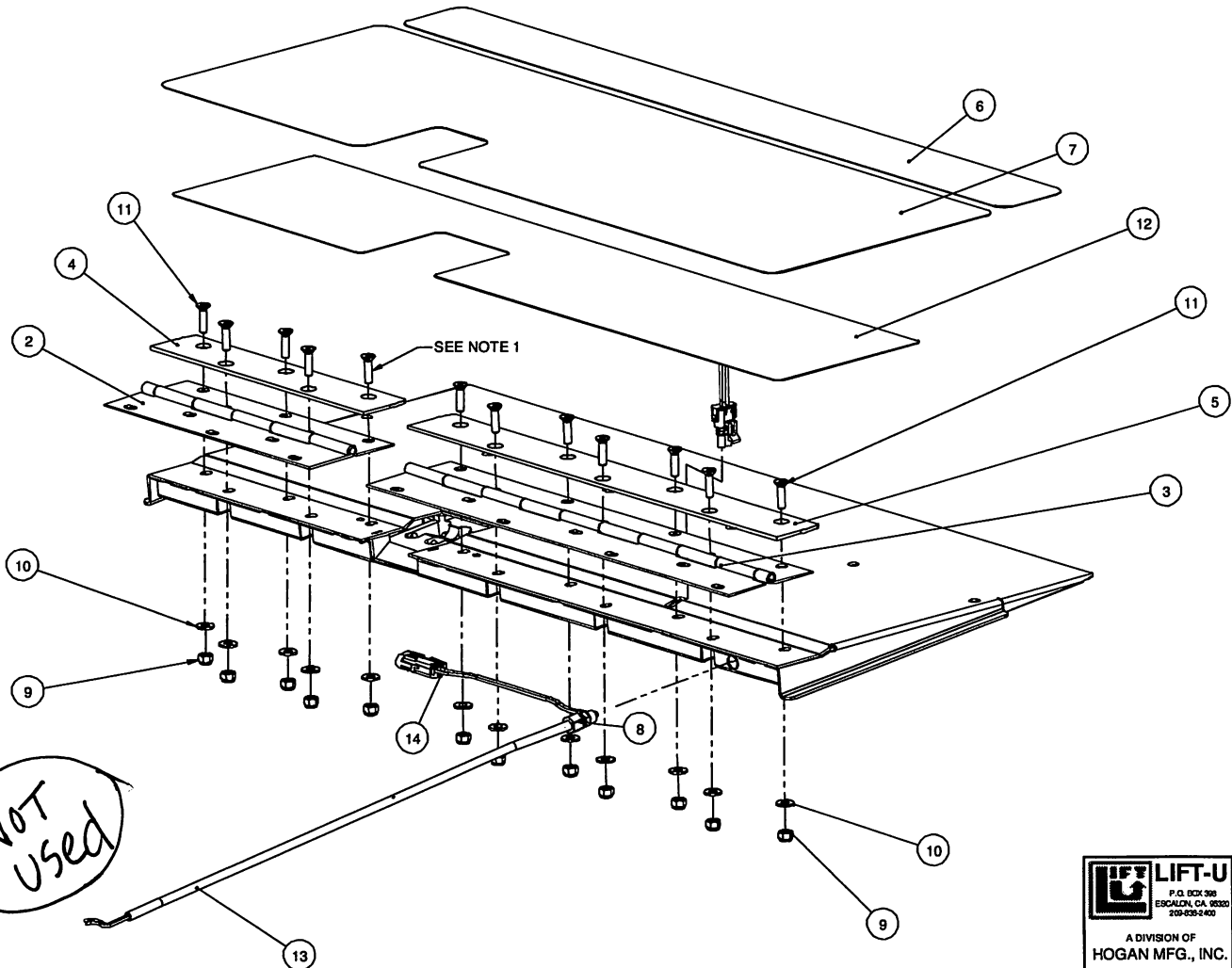
184-0109

SHEET NO.  
 1 OF 2

REVISION  
 C

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	<b>TITLE</b> <b>RAMP BARRIER ASSEMBLY</b>		
<b>DOCUMENT NO.</b> 184-0109	<b>SHEET NO.</b> 2 OF 2	<b>REVISION</b> C	

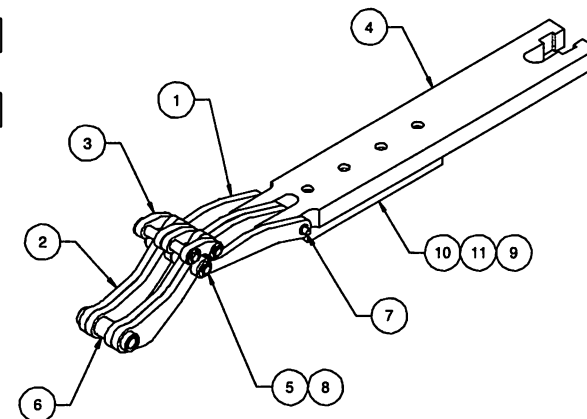
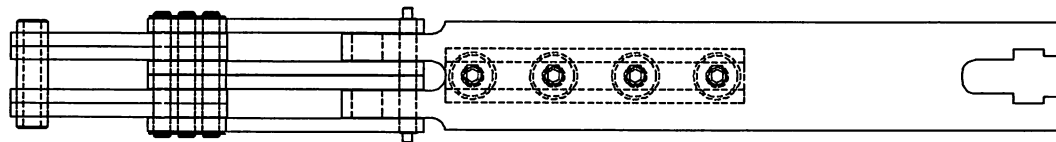


Part Number	Revision	Description
184-0109	C	RAMP BARRIER ASSEMBLY

ITEM	QTY	P/N	DESCRIPTION
1	1	128-0037	RAMP/BARRIER WELDMENT
2	1	123-0971	RAMP HINGE, FWD
3	1	123-0972	RAMP HINGE, REAR
4	1	123-0973	HINGE CLAMP BAR, FWD
5	1	123-0974	HINGE CLAMP BAR, REAR
6	1	123-0961	RAMP SAFETY WALK, EDGE
7	1	123-0975	RAMP SAFETY WALK
8	1	230-0039	COMPRESSION FITTING
9	12	423-9452	NYL INSR LOCKNUT, LT, SST
10	12	426-9104	SAE WASHER, SST
11	12	413-9408	HEX SOC FLAT HD CAP SCREW, SST.
12	1	373-0261	MEMBRANE SWITCH ASSY, RAMP
13	1.8408	220-0002	NYLON TUBING
14	1	331-0847	RAMP INTERLOCK EXTENSION

312-0227

PIVOT LINK 129-0154;  
PROOF TEST BEFORE  
WELDING INTO BARRIER



APPLY BLACK MAX (P/N 516-0012)  
UNDER HEAD OF ITEM 11

# NOTES:

1. APPLY COMMERCIAL ANTI-SEIZE COMPOUND (LIFT-U P/N 515-0007) TO PIVOT PINS, ITEM 11, AND INSIDE DIAMETER OF ITEMS 1 THRU 4 PRIOR TO ASSEMBLY AND PROOF TEST.
2. PROOF LOAD TEST THE LINKAGE ASSEMBLY BEFORE INSTALLING IN A LIFT, USING THE PROOF LOAD TEST FIXTURES 96-001-40C AND 96-001-42B.
3. SPARE PARTS NOTE:  
ITEMS 1, 2 & 3 MUST NOT BE SOLD INDIVIDUALLY - SELL ONLY AS AN ASSEMBLY (REF. KIT P/N 184-0117) THAT HAS PASSED THE PROOF LOAD TEST.

## UNLESS OTHERWISE SPECIFIED:

- INTERPRET DRAWING PER ANSI Y14.5-1982.
- DIMENSIONS ARE IN INCHES.
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45°
- TOLERANCES (+ OR -):

DECIMAL: FRACTION: 1/16  
 .XX = .00  
 .XXX = .010 ANGLE: 1/2 DEGREE  
 .XXXX = .0005

## COATING / FINISH

DESC: NONE

SPEC: NONE

FIRST USE REFERENCE:

184-0109

SCALE: 1:1.125

WEIGHT:  
(LBS.)



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TITLE RAMP BARRIER LINKAGE ASSEMBLY

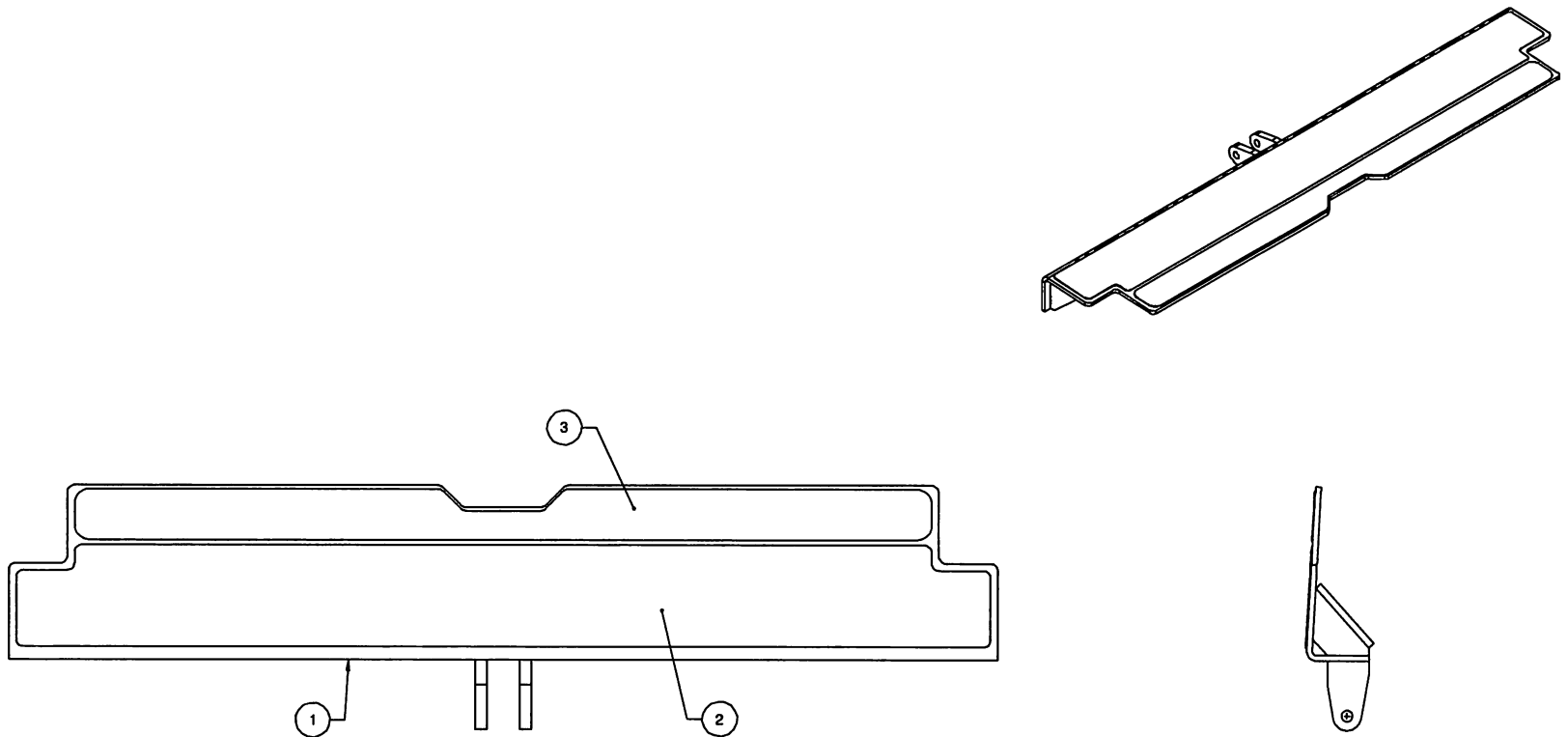
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SHEET NO. 1 OF 1 REVISION B

Part Number	Revision	Description
184-0110	B	RAMP BARRIER LINKAGE ASSY

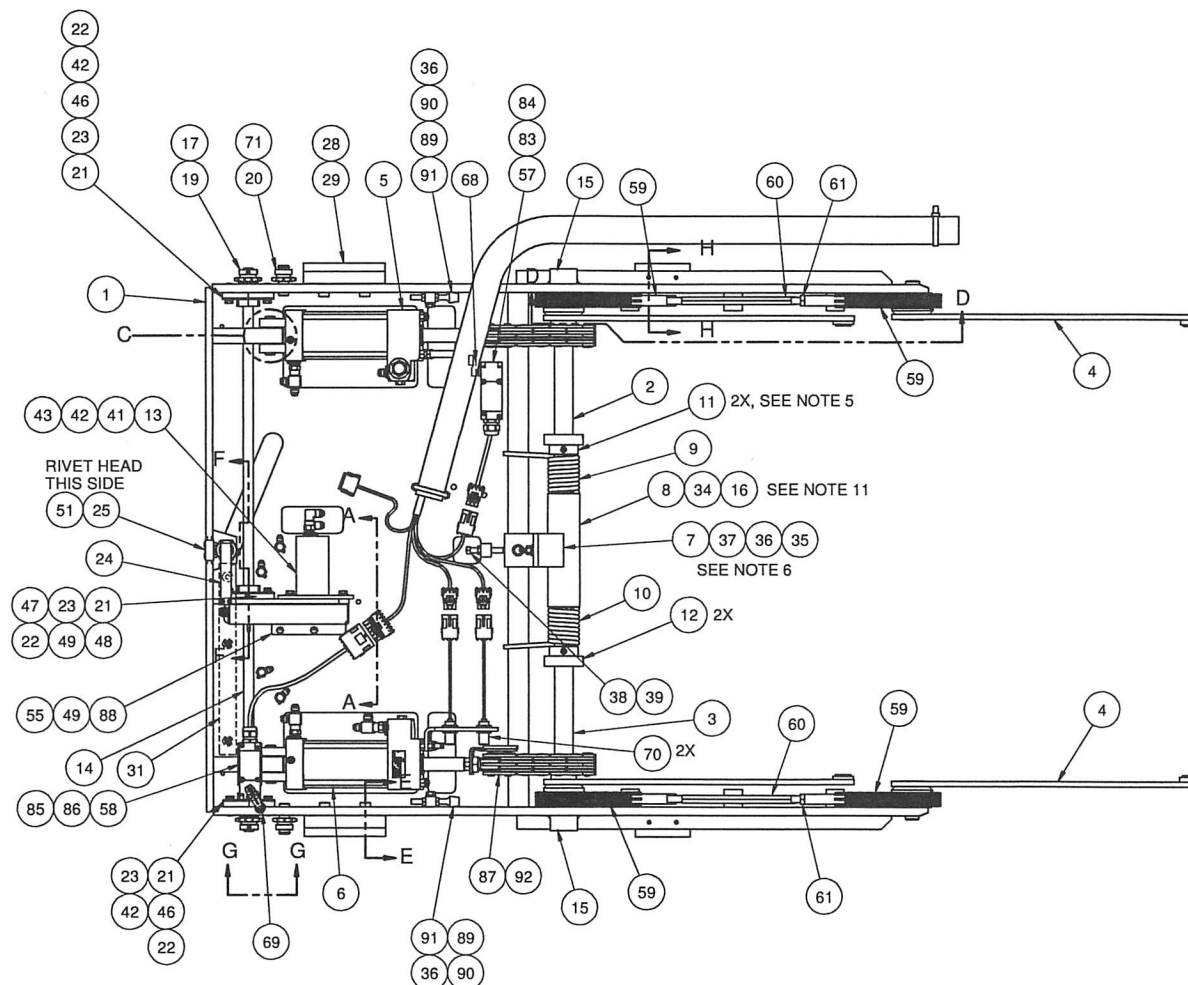
ITEM	QTY	P/N	DESCRIPTION
1	4	123-0978	CONNECTING LINK
2	4	123-0977	CONTROL LINK
3	4	D36-6399	FLOATING LINK
4	1	123-0979	SLIDE LINK
5	3	D50-9483	LINKAGE PIVOT PIN, 2"L
6	1	D36-6426	LINKAGE PIVOT SLEEVE
7	1	123-0980	LINKAGE PIVOT PIN
8	6	432-0503	RETAINING RING, SST
9	1	123-0981	SPACER, BEARING STRIP
10	1	123-0982	BEARING STRIP
11	4	413-9610	HEX SOC FLAT HD CAP SCREW, SST.



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- INTERPRET DRAWING PER ANSI Y14.5-1982.		DESC: NONE				
- DIMENSIONS ARE IN INCHES.		SPEC: NONE				
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.		FIRST USE REFERENCE: 183-0118				
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.				TITLE <b>BRIDGE/BARRIER ASSEMBLY (SST)</b>		
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45°				DOCUMENT NO. 184-0114		
- TOLERANCES (+ OR -):				SHEET NO. 1 OF 1		
DECIMAL:		FRACTION: 1/16		REVISION A		
.XX = .00		ANGLE: 1/2 DEGREE				
.XXX = .010						
.XXXX = .0005						
		SCALE: 1:2				
		WEIGHT: (LBS)				
		17.046				

Part Number	Revision	Description
184-0114	A	BRIDGE/BARRIER ASSY (SST)

ITEM	QTY	P/N	DESCRIPTION
1	1	126-0040	BRIDGE/BARRIER WELDMENT (SST)
2	1	127-0085	BRIDGE SAFETY WALK
3	1	127-0087	BRIDGE SAFETY WALK, EDGE



# NOTES:

1. TORQUE PROCEDURES ARE AS FOLLOWS:  
FASTENERS PER LIFT-U SPEC 531-0002.  
FITTINGS PER LIFT-U SPEC 531-0003.
2. LUBRICATE ITEM 62 PER LIFT-U SPEC 531-0004.
3. APPLY LOCTITE 242, BLUE (P/N 516-0010) TO ALL SETSCREWS & ITEM 50 PER MFG'S INSTRUCTIONS.
4. APPLY ANTI-CORROSION LUBRICANT (P/N 515-0006) TO CYLINDER PINS.
5. ITEM 11, SET COLLAR, IS TO BE ADJUSTED AT NEXT ASSEMBLY LEVEL.

6. ADJUST ITEM 38 UNTIL FULL CONTACT BETWEEN ITEMS 7 & 8. LUBRICATE AT LUBE FITTING WITH MULTI-PURPOSE GREASE (P/N 515-0008).
7. USE CABLE TIES AS REQUIRED, TRIM AFTER INSTALLATION.
8. CAP ALL OPEN FITTINGS FOR STORAGE AND HANDLING.
9. ITEM 70 INCLUDES TWO JAM NUTS.
10. ITEM 87 INCLUDES ONE COTTER PIN EACH.
11. APPLY COMMERCIAL ANTI-SEIZE COMPOUND (P/N 515-0007) TO ALL SST FASTENERS, I.D. OF ITEM 8, AND ITEMS 24 & 25.

## UNLESS OTHERWISE SPECIFIED:

- INTERPRET DRAWING PER ANSI Y14.5-1982.
- DIMENSIONS ARE IN INCHES.
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45°
- TOLERANCES (+ OR -):

DECIMAL: FRACTION: 1/16  
 .XX = .03  
 .XXX = .010  
 .XXXX = .0005  
 ANGLE: 1/2 DEGREE

## COATING / FINISH

DESC: NONE

SPEC: NONE

FIRST USE REFERENCE:

LU10-61

SCALE: 1:4.5 WEIGHT: 362.22 (LBS)



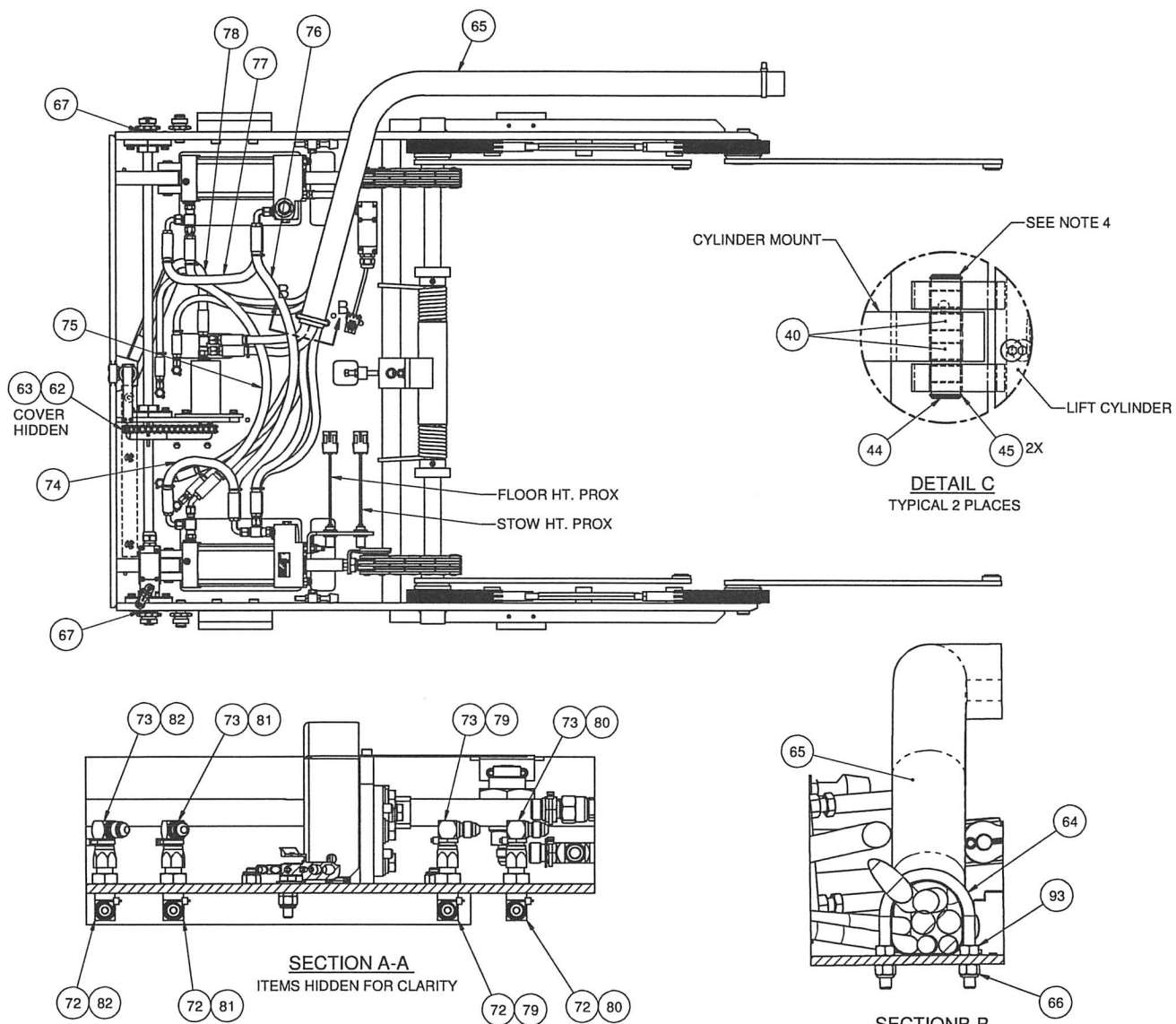
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TITLE  
**POWER PLATFORM ASSY**

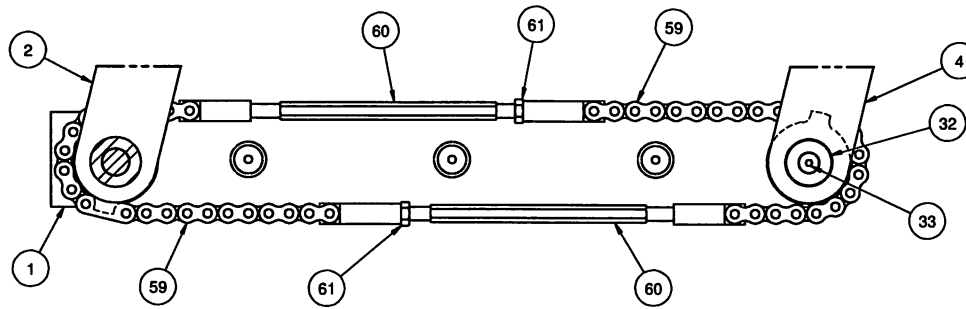
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SHEET NO. 1 OF 3 REVISION B

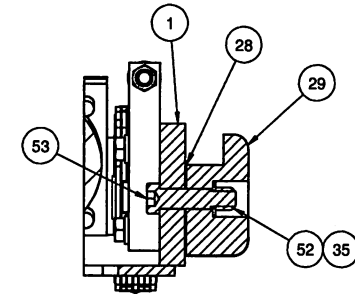
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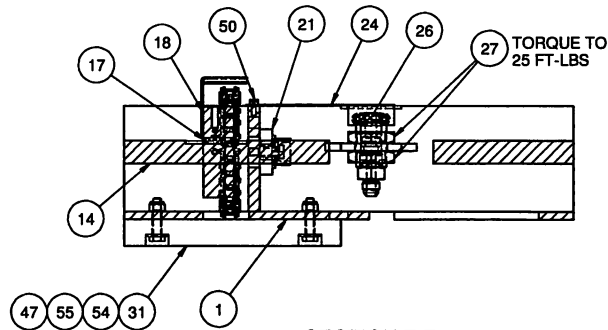
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<b>TITLE</b>	<b>POWER PLATFORM ASSY</b>		
<b>DOCUMENT NO.</b>	<b>185-0165</b>	<b>SHEET NO.</b> 2 OF 3	<b>REVISION</b> B



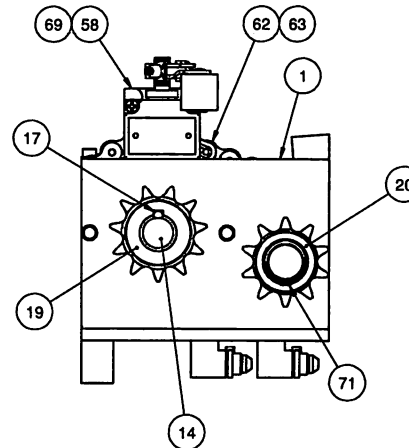
**SECTION D-D**  
ARMS ROTATED



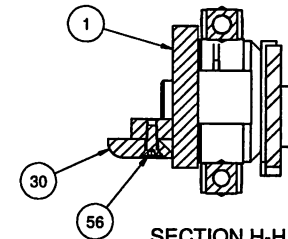
**SECTION E-E**  
ROTATED 90° CCW




**SECTION F-F**  
ROTATED 90° CW



**SECTION G-G**



**SECTION H-H**  
ROTATED 90° CCW

 <b>LIFT-U</b> P.O. BOX 398 ESCALON, CA. 95320 209-535-2400	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
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<b>TITLE</b> POWER PLATFORM ASSY		
<b>DOCUMENT NO.</b> 185-0165	<b>SHEET NO.</b> 3 OF 3	<b>REVISION</b> B



Part Number	Revision	Description
185-0165	B	POWER PLATFORM ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	D39-5074	POWER PLATFORM WELDMENT <REPLACES 131-0118>
2	1	187-0151	MASTER ARM ASSY, FWD
3	1	187-0152	MASTER ARM ASSY, REAR
4	2	187-0153	SLAVE ARM ASSY
5	1	272-0088	LIFT CYL ASSY, FORWARD
6	1	272-0089	LIFT CYL ASSY, REAR
7	1	188-0084	CRUTCH ASSY
8	1	D42-0900	TORQUE SHAFT COUPLING
9	1	D48-7291	RETURN SPRING, FORWARD
10	1	D48-7297	RETURN SPRING, REAR
11	2	438-0220	SET COLLAR, PLD.
12	2	D40-1314	SPLIT COLLAR
13	1	272-0087	DRIVE MOTOR ASSY
14	1	D39-1343	STOW SHAFT
15	2	D45-1426	SLEEVE BEARING
16	2	435-1548	PARALLEL KEY
17	3	435-1314	PARALELL KEY
18	1	D45-1852	KEYED SPROCKET
19	2	D45-1858	KEYED SPROCKET
20	2	D54-0758	IDLER ASSEMBLY
21	6	D40-1296	BEARING HALF
22	6	D40-1300	BEARING BUSHING
23	3	D40-1304	BEARING RETAINER
24	1	D40-9031	PLUNGER COVER
25	1	D40-1281	LATCH STRIKER
26	1	D62-8210	STOW LATCH CYL ASSY
27	2	422-2902	BRASS HEX JAM NUT, (MODIFIED)
28	2	D39-2531	BEARING BLOCK SHIM, ROADSIDE
29	2	D39-2744	BEARING BLOCK, ROADSIDE
30	2	D39-2638	BEARING BLOCK, CURBSIDE
31	1	D40-1177	SPLASH SHIELD BUMPER
32	2	144-0028	SLAVE ARM RETAINER
33	2	413-9808	HEX SOC FLAT HD CAP SCREW, SST
34	4	417-1608	HS SET SCR, CUP PT <REPLACES 431-2163>
35	5	426-9106	SAE WASHER, SST <REPLACES 426-2122>

ITEM	QTY	P/N	DESCRIPTION
36	5	427-0206	HLCL SPR LOCKWASHER <REPLACES 427-2111>
37	1	411-9860	HEX HD CAP SCREW, SST
38	1	417-9882	SQ HD SET SCREW, CUP PT, SST
39	1	422-9652	HEX JAM NUT, SST
40	4	D45-1626	SLEEVE BEARING
41	3	426-9105	SAE WASHER, SST
42	7	427-9105	HLCL SPR LOCKWASHER
43	3	411-9506	HEX HEAD CAP SCREW, SST
44	2	D12-4773	CLEVIS PIN, 17mm
45	4	432-0004	RETAINING RING, SST
46	4	411-9510	HEX HD CAP SCREW,SST
47	5	426-9104	SAE WASHER, SST
48	2	427-0204	HLCL SPR LOCKWASHER
49	4	411-9408	HEX HD CAP SCREW,SST
50	2	412-9153	HEX SOC HD CAP SCREW, SST
51	2	440-0040	SST BLIND RIVET
52	4	423-9801	NYL INSR LOCKNUT, LT, SST
53	4	416-9810	HEX SOC HD SHOULDER SCREW, SST
54	3	411-9410	HEX HD CAP SCREW, SST
55	5	423-9452	NYL INSR LOCKNUT, LT, SST
56	4	413-9407	HEX SOC FLAT HD CAP SCREW; LKG, SST
57	1	D10-2501	LIMIT SWITCH ASSY, CHAIN
58	1	D10-2494	LIMIT SWITCH ASSY, STOW/DEPLOY
59	4	D54-0836	SLAVE CHAIN ASSY
60	4	D12-5091	TURNBUCKLE
61	4	422-2801	HEX JAM NUT
62	1	D44-5878	CHAIN STRAND <REPLACES 151-5010>
63	1	D44-5863	CONNECTING LINK
64	1	437-0074	U-BOLT, W/NUT; SST
65	1	188-0148	POWER HARNESS, PP/BHD
66	2	423-9701	NYL INSR LOCKNUT, LT
67	2	133-0122	SPACER
68	1	D90-4688	LIMIT SWITCH ARM (ALL SST)
69	1	D90-7949	LIMIT SWITCH ARM <REPLACES 311-0021> (ALL SST)
70	2	D10-2495	PROXIMITY SWITCH ASSY

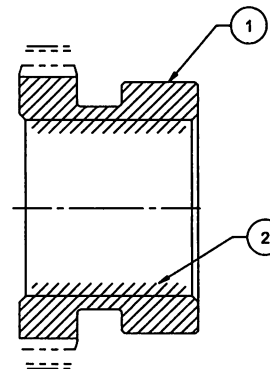
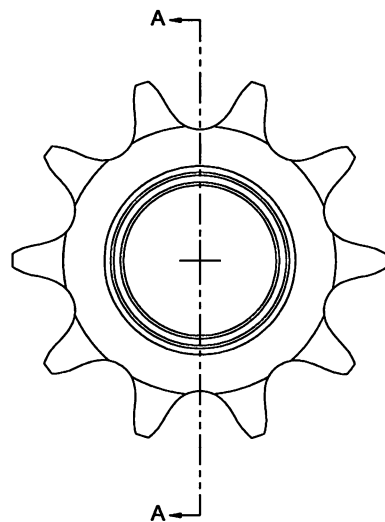
ITEM	QTY	P/N	DESCRIPTION
71	2	432-1202	RETAINING RING
72	4	233-3044	HYD FITTING
73	4	234-3444	HYD FITTING
74	1	222-0103	HYD HOSE ASSY, BROWN
75	1	222-0086	HYD HOSE ASSY, BROWN
76	1	222-0085	HYD HOSE ASSY, ORANGE
77	1	222-0084	HYD HOSE ASSY, BROWN
78	1	222-0083	HYD HOSE ASSY
79	2	436-0014	CABLE TIE, GRAY
80	2	436-0013	CABLE TIE, PURPLE
81	2	436-0004	CABLE TIE, GRN
82	2	436-0003	CABLE TIE, YEL
83	2	412-8264	HEX SOC HD CAP SCREW
84	2	423-9251	NYL INSR LOCKNUT, LT
85	2	427-0202	HLCL SPR LOCKWASHER, SST
86	2	412-9282	HEX SOC HD CAP SCREW
87	4	D44-1472	LEAF CONNECTING LINK
88	1	D39-1349	DRIVE CHAIN GUARD
89	2	D39-2681	STOP BRACKET
90	4	411-9606	HEX HD CAP SCREW, SST
91	2	161-0089	RUBBER BUMPER ASSY
92	2	D44-1466	LEAF CHAIN <REPLACES 151-0010>
93	2	422-9502	HEX NUT

Part Number	Revision	Description
185-0165	B	POWER PLATFORM ASSY

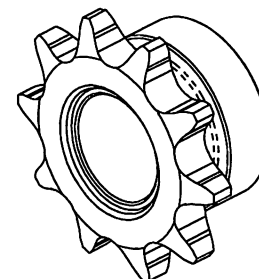
ITEM	QTY	P/N	DESCRIPTION
1	1	D39-5074	POWER PLATFORM WELDMNT <REPLACES 131-0118>
2	1	187-0151	MASTER ARM ASSY, FWD
3	1	187-0152	MASTER ARM ASSY, REAR
4	2	187-0153	SLAVE ARM ASSY
5	1	272-0088	LIFT CYL ASSY, FORWARD
6	1	272-0089	LIFT CYL ASSY, REAR
7	1	188-0084	CRUTCH ASSY
8	1	D42-0900	TORQUE SHAFT COUPLING
9	1	D48-7291	RETURN SPRING, FORWARD
10	1	D48-7297	RETURN SPRING, REAR
11	2	438-0220	SET COLLAR, PLD.
12	2	D40-1314	SPLIT COLLAR
13	1	272-0087	DRIVE MOTOR ASSY
14	1	D39-1343	STOW SHAFT
15	2	D45-1426	SLEEVE BEARING
16	2	435-1548	PARALLEL KEY
17	3	435-1314	PARALELL KEY
18	1	D45-1852	KEYED SPROCKET
19	2	D45-1858	KEYED SPROCKET
20	2	D54-0758	IDLER ASSEMBLY
21	6	D40-1296	BEARING HALF
22	6	D40-1300	BEARING BUSHING
23	3	D40-1304	BEARING RETAINER
24	1	D40-9031	PLUNGER COVER
25	1	D40-1281	LATCH STRIKER
26	1	D62-8210	STOW LATCH CYL ASSY
27	2	422-2902	BRASS HEX JAM NUT, (MODIFIED)
28	2	D39-2531	BEARING BLOCK SHIM, ROADSIDE
29	2	D39-2744	BEARING BLOCK, ROADSIDE
30	2	D39-2638	BEARING BLOCK, CURBSIDE
31	1	D40-1177	SPLASH SHIELD BUMPER
32	2	144-0028	SLAVE ARM RETAINER
33	2	413-9606	HEX SOC FLAT HD CAP SCREW, SST
34	4	417-1606	HS SET SCR, CUP PT <REPLACES 431-2163>
35	5	426-9106	SAE WASHER, SST <REPLACES 426-2122>


ITEM	QTY	P/N	DESCRIPTION
36	5	427-0206	HLCL SPR LOCKWASHER <REPLACES 427-2111>
37	1	411-9660	HEX HD CAP SCREW, SST
38	1	417-9682	SQ HD SET SCREW, CUP PT, SST
39	1	422-9652	HEX JAM NUT, SST
40	4	D45-1626	SLEEVE BEARING
41	3	426-9105	SAE WASHER, SST
42	7	427-9105	HLCL SPR LOCKWASHER
43	3	411-9506	HEX HEAD CAP SCREW, SST
44	2	D12-4773	CLEVIS PIN, 17mm
45	4	432-0004	RETAINING RING, SST
46	4	411-9510	HEX HD CAP SCREW,SST
47	5	426-9104	SAE WASHER, SST
48	2	427-0204	HLCL SPR LOCKWASHER
49	4	411-9408	HEX HD CAP SCREW,SST
50	2	412-9153	HEX SOC HD CAP SCREW, SST
51	2	440-0040	SST BLIND RIVET
52	4	423-8601	NYL INSR LOCKNUT, LT, SST
53	4	416-9810	HEX SOC HD SHOULDER SCREW, SST
54	3	411-8410	HEX HD CAP SCREW, SST
55	5	423-9452	NYL INSR LOCKNUT, LT, SST
56	4	413-9407	HEX SOC FLAT HD CAP SCREW; LKG, SST
57	1	D10-2501	LIMIT SWITCH ASSY, CHAIN
58	1	D10-2494	LIMIT SWITCH ASSY, STOW/DEPLOY
59	4	D54-0836	SLAVE CHAIN ASSY
60	4	D12-5091	TURNBUCKLE
61	4	422-2801	HEX JAM NUT
62	1	D44-5878	CHAIN STRAND <REPLACES 151-5010>
63	1	D44-5863	CONNECTING LINK
64	1	437-0074	U-BOLT, W/NUT; SST
65	1	188-0148	POWER HARNESS, PP/BHD
66	2	423-9701	NYL INSR LOCKNUT, LT
67	2	133-0122	SPACER
68	1	D90-4688	LIMIT SWITCH ARM (ALL SST)
69	1	D90-7949	LIMIT SWITCH ARM <REPLACES 311-0021> (ALL SST)
70	2	D10-2495	PROXIMITY SWITCH ASSY

ITEM	QTY	P/N	DESCRIPTION
71	2	432-1202	RETAINING RING
72	4	233-3044	HYD FITTING
73	4	234-3444	HYD FITTING
74	1	222-0103	HYD HOSE ASSY, BROWN
75	1	222-0086	HYD HOSE ASSY, BROWN
76	1	222-0085	HYD HOSE ASSY, ORANGE
77	1	222-0084	HYD HOSE ASSY, BROWN
78	1	222-0083	HYD HOSE ASSY
79	2	436-0014	CABLE TIE, GRAY
80	2	436-0013	CABLE TIE, PURPLE
81	2	436-0004	CABLE TIE, GRN
82	2	436-0003	CABLE TIE, YEL
83	2	412-9264	HEX SOC HD CAP SCREW
84	2	423-9251	NYL INSR LOCKNUT, LT
85	2	427-0202	HLCL SPR LOCKWASHER, SST
86	2	412-9262	HEX SOC HD CAP SCREW
87	4	D44-1472	LEAF CONNECTING LINK
88	1	D39-1349	DRIVE CHAIN GUARD
89	2	D39-2681	STOP BRACKET
90	4	411-9606	HEX HD CAP SCREW, SST
91	2	161-0069	RUBBER BUMPER ASSY
92	2	D44-1466	LEAF CHAIN <REPLACES 151-0010>
93	2	422-9502	HEX NUT



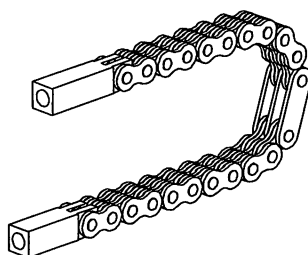
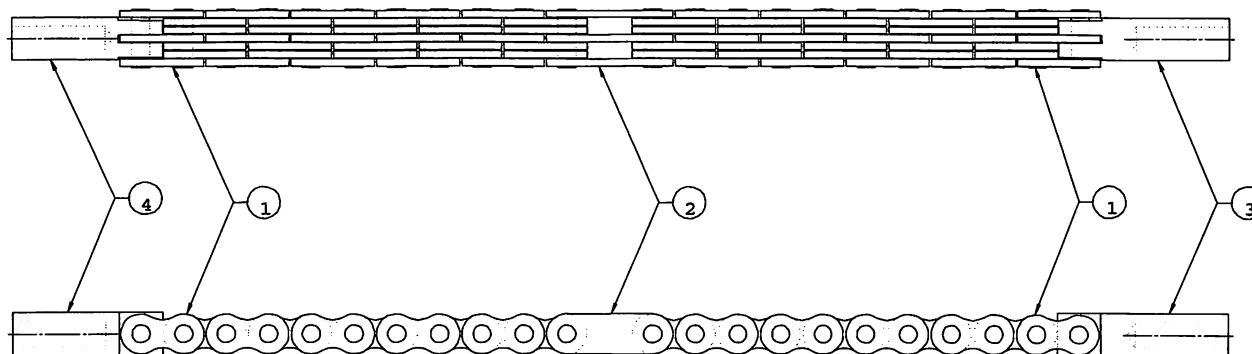
**SECTION A-A**




 <b>LIFT-U</b> P.O. BOX 398 ESCALON, CA 95320 209-528-2400	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.		
A DIVISION OF <b>HOGAN MFG., INC.</b>			
<b>TITLE</b> <span style="float: right;"><b>IDLER ASSY</b></span>			
<b>DOCUMENT NO.</b> <span style="float: right;"><b>D54-0758</b></span>	<table border="1" style="width: 100%;"> <tr> <td><b>SHEET NO.</b> 1 of 1</td> <td><b>REVISION</b> E</td> </tr> </table>	<b>SHEET NO.</b> 1 of 1	<b>REVISION</b> E
<b>SHEET NO.</b> 1 of 1	<b>REVISION</b> E		

Part Number	Revision	Description
D54-0758	E	IDLER ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	D45-1864	IDLER SPROCKET;
2	1	D45-1433	SLEEVE BEARING

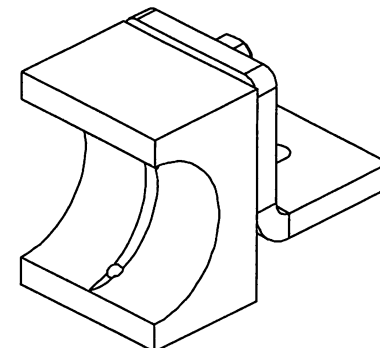
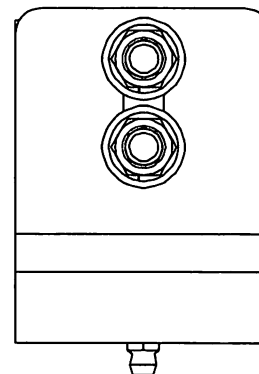
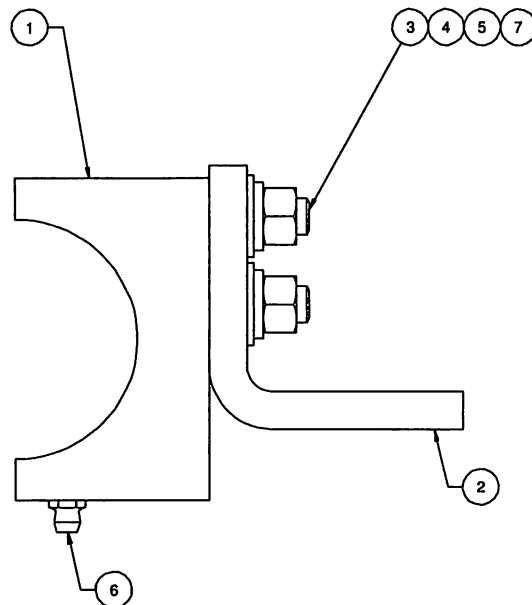


**NOTE:**  
 COAT DRY PARTS PRIOR TO ASSEMBLY  
 WITH HYDROTEX CORROSION CONTROL  
 LUBRICANT (NIG H2 CONSISTENCY GREASE),  
 LEFT-U P/N 515-0006. A SURFACE COATING  
 ONLY IS NOT ACCEPTABLE.

 <b>LIFT-U</b> ESCALON, CALIFORNIA A DIVISION OF <b>HOGAN MFG., INC.</b>	THIS DOCUMENT IS AND CONTAINS TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THE DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
	<b>TITLE</b> SLAVE CHAIN ASSY	
<b>DOCUMENT NO.</b> D54-0836	<b>SHEET NO.</b> 1 OF 1	<b>REVISION</b> D

Part Number	Revision	Description
D54-0836	D	SLAVE CHAIN ASSY

ITEM	QTY	P/N	DESCRIPTION
1	2	D44-8829	LEAF CONNECTING LINK
2	1	D44-8843	LEAF CHAIN ASSY
3	1	D47-2156	SLAVE CHAIN CLEVIS, RH
4	1	D47-2161	SLAVE CHAIN CLEVIS, LH



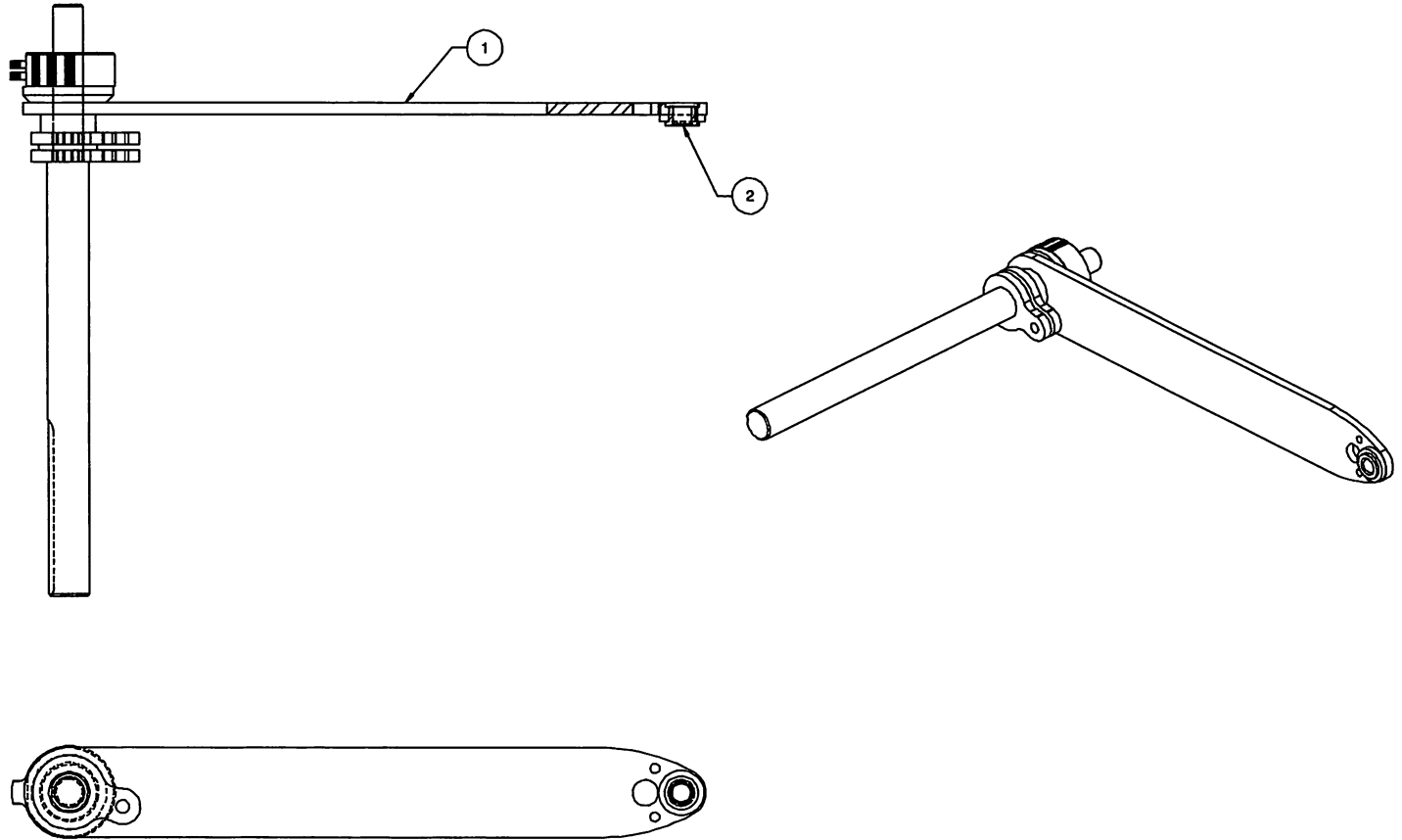
NOTE:  
APPLY COMMERCIAL ANTI-SEIZE (P/N 515-0007)  
TO ITEM 3 PRIOR TO ASSEMBLY.


UNLESS OTHERWISE SPECIFIED:		COATING / FINISH	
<ul style="list-style-type: none"> <li>INTERPRET DRAWING PER ANSI Y14.5-1982.</li> <li>DIMENSIONS ARE IN INCHES.</li> <li>FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.</li> <li>DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.</li> <li>DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45°</li> <li>TOLERANCES (+ OR -):</li> </ul>		DESC: NONE  SPEC: NONE	
DECIMAL: .XX = .03 .XXX = .010 .XXXX = .0005		FRACTION: 1/16  ANGLE: 1/2 DEGREE	
FIRST USE REFERENCE:		185-0163	
SCALE: 1:0.6		WEIGHT: 4.32 (LBS)	
LIFT-U P.O. BOX 298 ESCALON, CA 95320 209-435-2400 A DIVISION OF HOGAN MFG., INC.		THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
DOCUMENT NO. 186-0064		TITLE CRUTCH ASSEMBLY SHEET NO. 1 OF 1 REVISION B	

Part Number	Revision	Description
186-0064	B	CRUTCH ASEMBLY

ITEM	QTY	P/N	DESCRIPTION
1	1	D40-9190	CRUTCH BEARING
2	1	D40-9184	CRUTCH ANGLE
3	2	136-0089	THREADED STUD
4	2	426-9106	SAE WASHER, SST <REPLACES 426-2122>
5	2	422-9601	HEX NUT
6	1	163-0030	LUBE FITTING, STR (SST)
7	2	427-0206	HLCL SPR LOCKWASHER <REPLACES 427-2111>

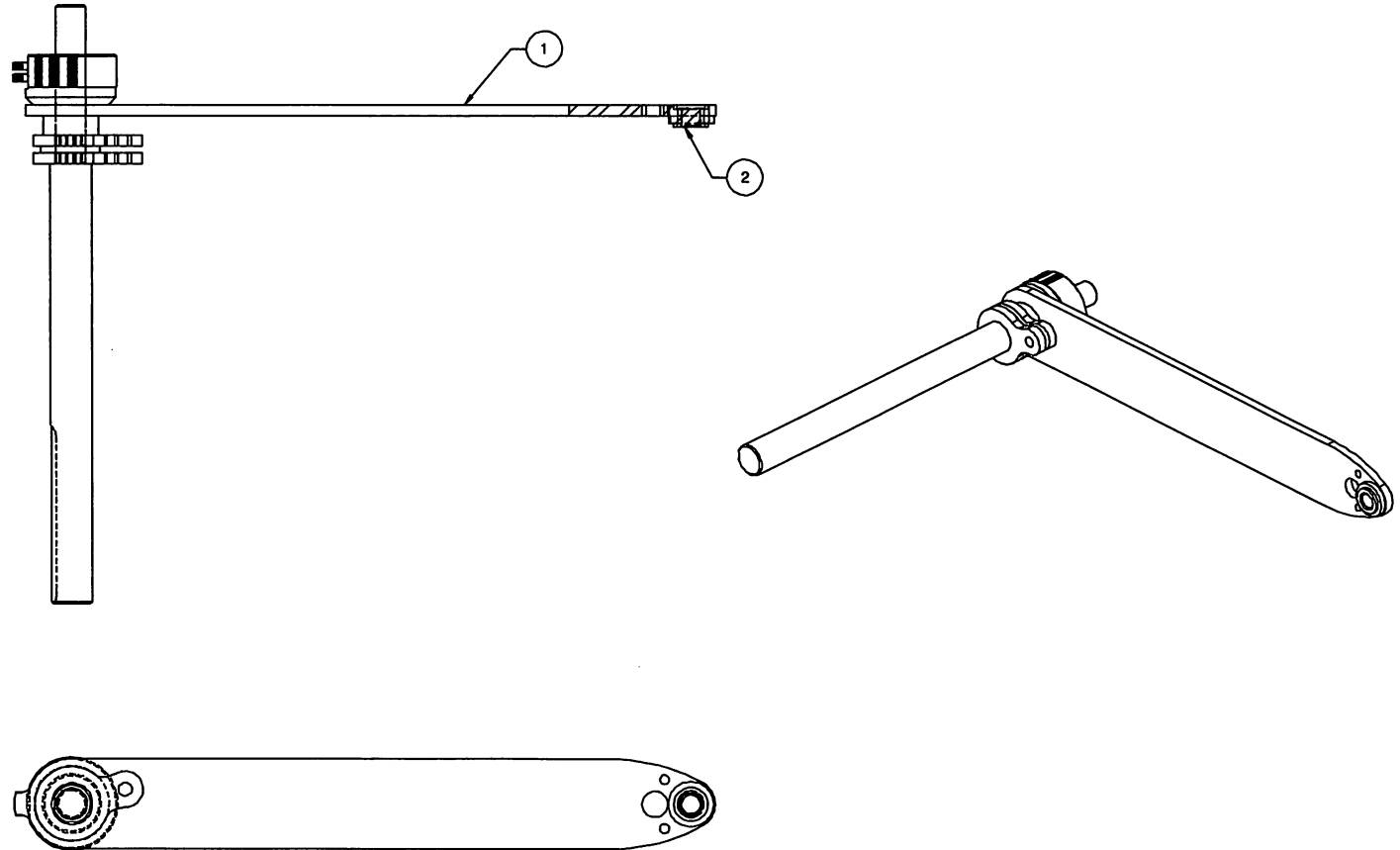





<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>		 <b>LIFT-U</b> P.O. BOX 330 ESCALON, CA 95320 209-838-2400  A DIVISION OF <b>HOGAN MFG., INC.</b>	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
- INTERPRET DRAWING PER ANSI Y14.5-1982. - DIMENSIONS ARE IN INCHES. - FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. - DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING - DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45° - TOLERANCES (+ OR -):  DECIMAL:                      FRACTION: 1/16 .XX     = .03                      .XX     = 1/16 .XXX    = .010                    .XXX   = 1/8 .XXXX   = .0005                  .XXXX = 1/32		DESC: NONE  SPEC: NONE				
FIRST USE REFERENCE:  185-0165		SCALE: 1:2      WEIGHT: 18.8262 (LBS)				
TITLE  MASTER ARM ASSY, FWD				DOCUMENT NO.  187-0151	SHEET NO. 1 OF 1	REVISION A

Part Number	Revision	Description
187-0151	A	MASTER ARM ASSY, FWD

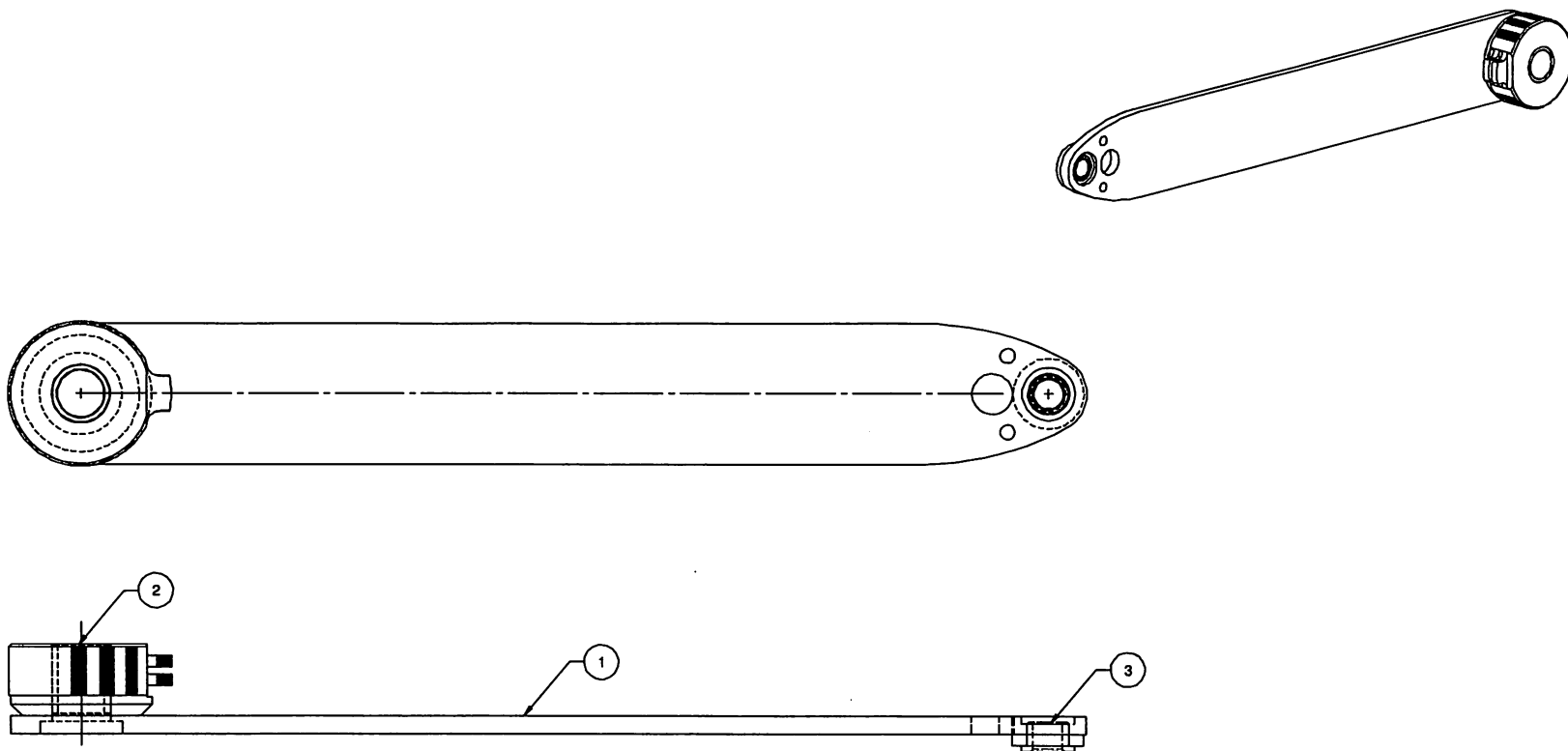
ITEM	QTY	P/N	DESCRIPTION
1	1	141-0168	MASTER ARM WELDMENT, FWD
2	1	D45-1419	FLANGED BEARING (CHAMFERED)



<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>		 <b>LIFT-U</b> P.O. BOX 398 ESCALON, CA 95320 202-538-2402	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
- INTERPRET DRAWING PER ANSI Y14.5-1982. - DIMENSIONS ARE IN INCHES. - FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. - DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. - DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45° - TOLERANCES (+ OR -):		DESC: NONE				
		SPEC: NONE				
		FIRST USE REFERENCE:				
DECIMAL:                      FRACTION: 1/16 XX     = .00 XXX    = .010 XXXX   = .0005		ANGLE: 1/2 DEGREE		185-0165		
		SCALE: 1:2	WEIGHT: 18.8262 (LBS.)	TITLE <b>MASTER ARM ASSY, REAR</b>		
				DOCUMENT NO. 187-0152	SHEET NO. 1 OF 1	REVISION A

Part Number	Revision	Description
187-0152	A	MASTER ARM ASSY, REAR

ITEM	QTY	P/N	DESCRIPTION
1	1	141-0169	MASTER ARM WELDMENT, REAR
2	1	D45-1419	FLANGED BEARING (CHAMFERED)




**UNLESS OTHERWISE SPECIFIED:**

- INTERPRET DRAWING PER ANSI Y14.5-1982.
- DIMENSIONS ARE IN INCHES.
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45°
- TOLERANCES (+ OR -):

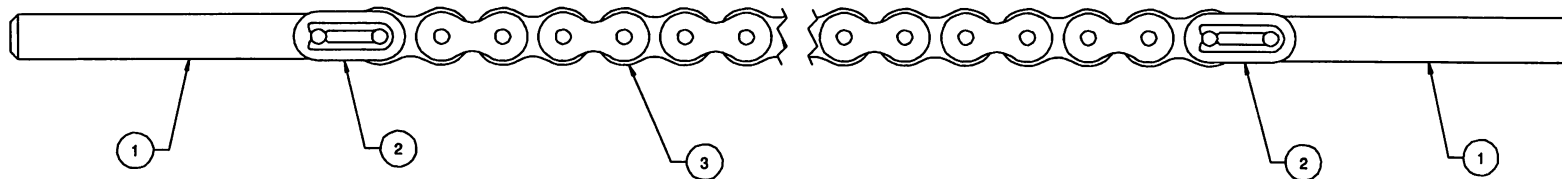
DECIMAL:	FRACTION: 1/16
.XX = .03	
.XXX = .010	ANGLE: 1/2 DEGREE
.XXXX = .0005	

COATING / FINISH	
DESC: NONE	
SPEC: NONE	
FIRST USE REFERENCE:	
185-0165	
SCALE: 1:1.25	WEIGHT: 9.6493 (LBS)


 <b>LIFT-U</b> <small>P.O. BOX 369 ESCALON, CA 95320 209-535-2400</small>	<small>THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL, TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.</small>	
	<small>A DIVISION OF</small> <b>HOGAN MFG., INC.</b>	
	<b>TITLE</b> <b>SLAVE ARM ASSY</b>	
<small>DOCUMENT NO.</small> <b>187-0153</b>	<small>SHEET NO.</small> <b>1 OF 1</b>	<small>REVISION</small> <b>A</b>

Part Number	Revision	Description
187-0153	A	SLAVE ARM ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	142-0106	SLAVE ARM WELDMENT
2	1	D45-1437	SLEEVE BEARING
3	1	D45-1419	FLANGED BEARING (CHAMFERED)



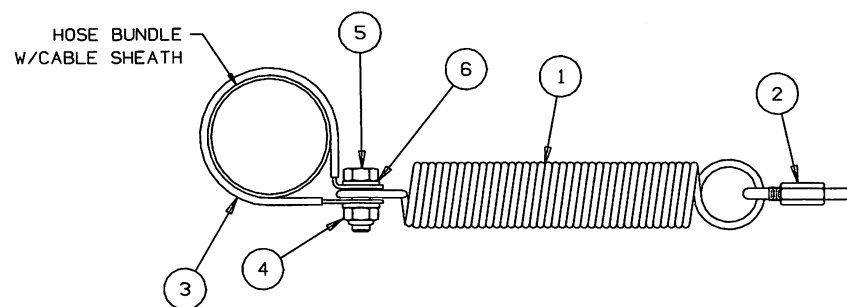
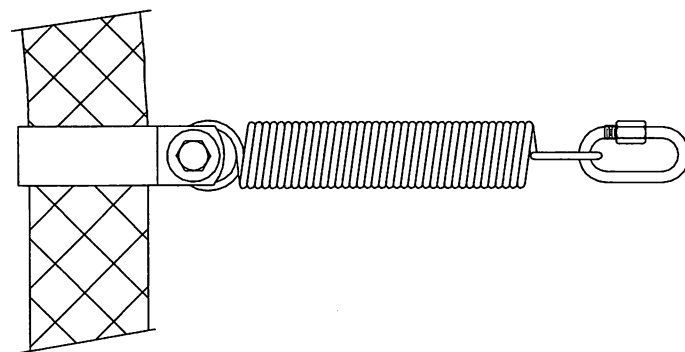
NOTE:  
1. LUBRICATE ITEMS 2 AND 3 PER LIFT-U SPEC X531-0004  
PRIOR TO ASSEMBLY.

<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>		<div><b>LIFT-U</b> P.O. BOX 308 ESCALON, CA 95329 209-636-2400</div> <div>A DIVISION OF <b>HOGAN MFG., INC.</b></div> <div>THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG, INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.</div>	
- INTERPRET DRAWING PER ANSI Y14.5-1982.		DESC: NONE			
- DIMENSIONS ARE IN INCHES.		SPEC: NONE			
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.		FIRST USE REFERENCE:			
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.		H005		<b>TITLE</b> <b>STOW/DEPLOY CHAIN ASSY</b>	
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45°		SCALE: 2:1			<b>DOCUMENT NO.</b> D55-8427
- TOLERANCES (+ OR -):		WEIGHT: 4.60			
DECIMAL: FRACTION: 1/16				<b>REVISION</b> C	
.XX = .03					
.XXX = .010					
.XXXX = .0005					
ANGLE: 1/2 DEGREE					

Part Number	Revision	Description
D55-8427	C	STOW/DEPLOY CHAIN ASSY

ITEM	QTY	P/N	DESCRIPTION
1	2	D34-2161	CHAIN TENSIONER
2	2	D44-5863	CONNECTING LINK
3	1	D44-5915	CHAIN STRAND



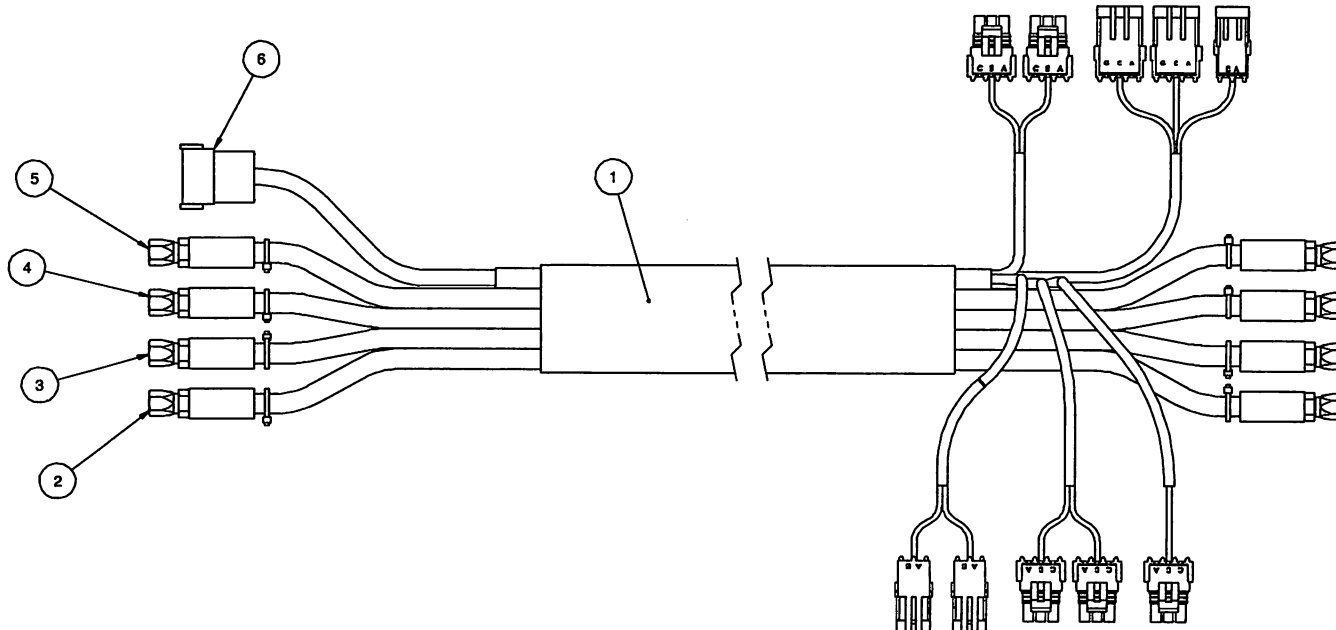



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HOSE BUNDLE SPRING/CLAMP KIT  
 D55-0962  
 Rev A

Part Number	Revision	Description
D55-0962	A	HOSE BUNDLE SPRING/CLAMP KIT

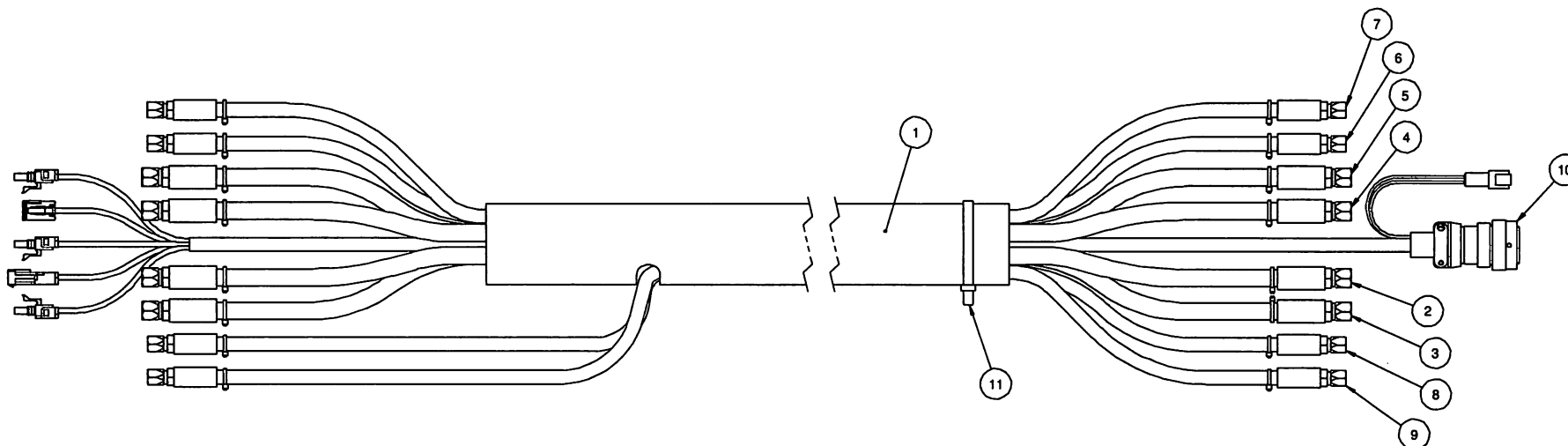
ITEM	QTY	P/N	DESCRIPTION
1	1	D48-4422	EXTENSION SPRING
2	1	437-0051	COIL CHAIN CONNECTOR
3	1	437-0053	LOOP CLAMP
4	1	423-2501	NYL INSR LOCKNUT, LT
5	1	411-2510	HEX HD CAP SCREW
6	2	426-2105	SAE WASHER




<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>	
- INTERPRET DRAWING PER ANSI Y14.5-1982. - DIMENSIONS ARE IN INCHES. - FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. - DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. - DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45° - TOLERANCES (+ OR -): DECIMAL: .XX = .03 .XXX = .010 .XXXX = .0005 FRACTION: 1/16 ANGLE: 1/2 DEGREE		<b>DESC:</b> NONE  <b>SPEC:</b> NONE  <b>FIRST USE REFERENCE:</b> LU10-64  <b>SCALE:</b> 1:1.5 <b>WEIGHT:</b> (LBS.)	
 <b>LIFT-U</b> P.O. BOX 399 ESCALON, CA. 95320 209-436-2400  A DIVISION OF <b>HOGAN MFG., INC.</b>		THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
<b>TITLE</b>		<b>POWER HARNESS, LP/PP</b>	
<b>DOCUMENT NO.</b>		188-0146	
<b>SHEET NO.</b>		1 OF 1	
<b>REVISION</b>		A	

Part Number	Revision	Description
188-0146	A	POWER HARNESS LP/PP

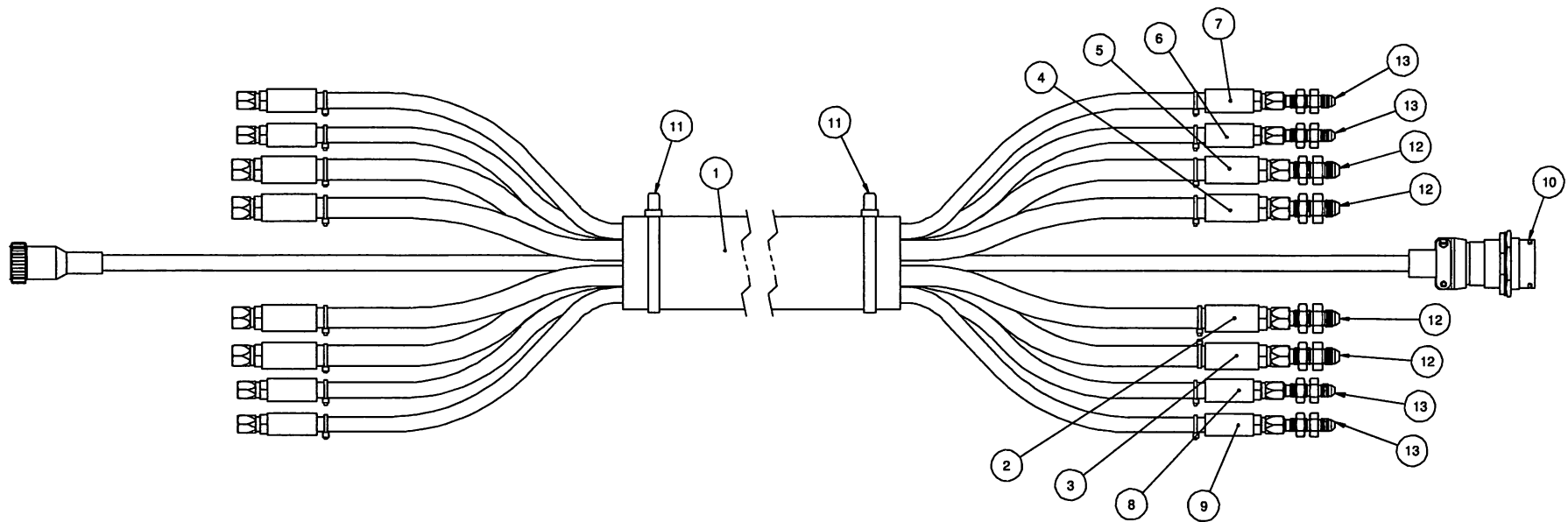
ITEM	QTY	P/N	DESCRIPTION
1	48	333-0171	CABLE SHEATH; 2" DIA
2	1	221-0658	HYD HOSE ASSY, PURPLE
3	1	221-0659	HYD HOSE ASSY, GRAY
4	1	221-0660	HYD HOSE ASSY, GREEN
5	1	221-0661	HYD HOSE ASSY, YELLOW
6	1	331-0851	CABLE ASSY, PP/LP




UNLESS OTHERWISE SPECIFIED:		COATING / FINISH	
INTERPRET DRAWING PER ANSI Y14.5-1982. DIMENSIONS ARE IN INCHES. FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45° TOLERANCES (+ OR -): DECIMAL: .0005 FRACTION: 1/16 ANGLE: 1/2 DEGREE		DESC: NONE SPEC: NONE FIRST USE REFERENCE: LU10-61 SCALE: 1:2 WEIGHT: (LBS)	
 <b>LIFT-U</b> P.O. BOX 308 ESCALON, CA 95320 209-439-2400 A DIVISION OF <b>HOGAN MFG., INC.</b>		THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
<b>TITLE</b> <b>POWER HARNESS, PP/BHD</b>		<b>DOCUMENT NO.</b> 188-0148 <b>SHEET NO.</b> 1 OF 1 <b>REVISION</b> A	

Part Number	Revision	Description
188-0148	A	POWER HARNESS PP/BHD

ITEM	QTY	P/N	DESCRIPTION
1	1	D97-9312	CABLE SHEATH, 2 1/2 X 118
2	1	222-0184	HYD HOSE ASSY, BLACK
3	1	222-0185	HYD HOSE ASSY, WHITE
4	1	222-0186	HYD HOSE ASSY, BROWN
5	1	222-0187	HYD HOSE ASSY, ORANGE
6	1	221-0407	HYD HOSE ASSY, GREEN
7	1	221-0408	HYD HOSE ASSY, YELLOW
8	1	221-0409	HYD HOSE ASSY, GRAY
9	1	221-0410	HYD HOSE ASSY, PURPLE
10	1	331-0857	CABLE ASSY, PP/BHD
11	1	436-0015	CABLE TIE, BLACK, 250#

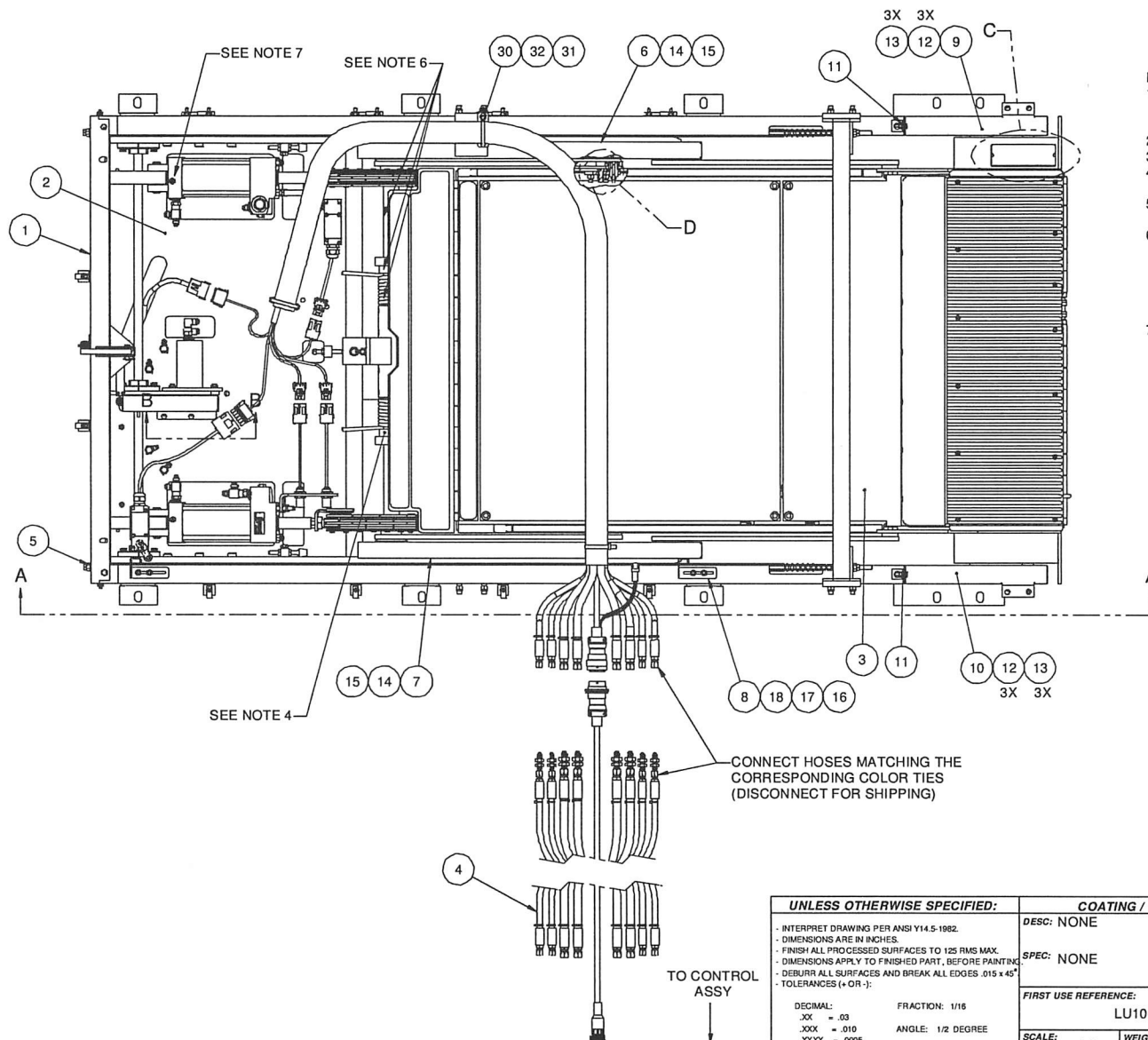


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DECIMAL:                      FRACTION: 1/16 XXX       = .03 XXXX     = .010 XXXXX    = .0005		ANGLE: 1/2 DEGREE		TITLE <b>POWER HARNESS, CONTROL/BHD</b>		
SCALE: 1:5		WEIGHT: (LBS)		DOCUMENT NO. 188-0151	SHEET NO. 1 OF 1	REVISION A

Part Number	Revision	Description
188-0151	A	POWER HARNESS CONTROL/BHD

ITEM	QTY	P/N	DESCRIPTION
1	164	333-0172	CABLE SHEATH; 2 1/2" DIA
2	1	222-0176	HYD HOSE ASSY, BLACK
3	1	222-0177	HYD HOSE ASSY, WHITE
4	1	222-0178	HYD HOSE ASSY, BROWN
5	1	222-0179	HYD HOSE ASSY, ORANGE
6	1	221-0395	HYD HOSE ASSY, GREEN
7	1	221-0396	HYD HOSE ASSY, YELLOW
8	1	221-0397	HYD HOSE ASSY, GRAY
9	1	221-0398	HYD HOSE ASSY, PURPLE
10	1	331-0856	CABLE ASSY, CONTROL/BHD
11	4	436-0015	CABLE TIE, BLACK, 250#
12	4	233-1066	HYD FITTING
13	4	233-1044	HYD FITTING





# NOTES:

1. TORQUE PROCEDURES AS FOLLOWS:  
FASTENERS PER LIFT-U SPEC 531-0002  
FITTINGS PER LIFT-U SPEC 531-0003
2. LUBRICATE ALL CHAINS PER LIFT-U SPEC 531-0004.
3. ADJUST SLAVE CHAINS PER LIFT-U SPEC 531-0007.
4. ROTATE LIFT ARMS VERTICAL BEFORE TIGHTENING SET COLLARS.  
ADJUST SET COLLARS TO CLEAR RETURN SPRINGS BY 1/16".
5. APPLY COMMERCIAL ANTI-SEIZE (P/N 515-0007) TO ALL SST FASTENERS.
6. APPLY BLACK PRIMER (P/N 512-0005) AND GLOSS EPOXY ENAMEL (P/N 512-0006) TO:  
a. TORQUE SHAFT BETWEEN COUPLING AND LIFT CHAIN HUB; 2X  
b. TORSION SPRINGS; 2X  
c. SET COLLARS; 2X  
d. SET SCREWS; 4X
7. SEAL CUSHION VALVE ADJUSTMENT WITH SILICONE (P/N 517-0001).

## UNLESS OTHERWISE SPECIFIED:

- INTERPRET DRAWING PER ANSI Y14.5-1982.
- DIMENSIONS ARE IN INCHES.
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45°.
- TOLERANCES (+ OR -):

DECIMAL: FRACTION: 1/16  
XX = .03  
XXX = .010  
XXXX = .0005  
ANGLE: 1/2 DEGREE

## COATING / FINISH

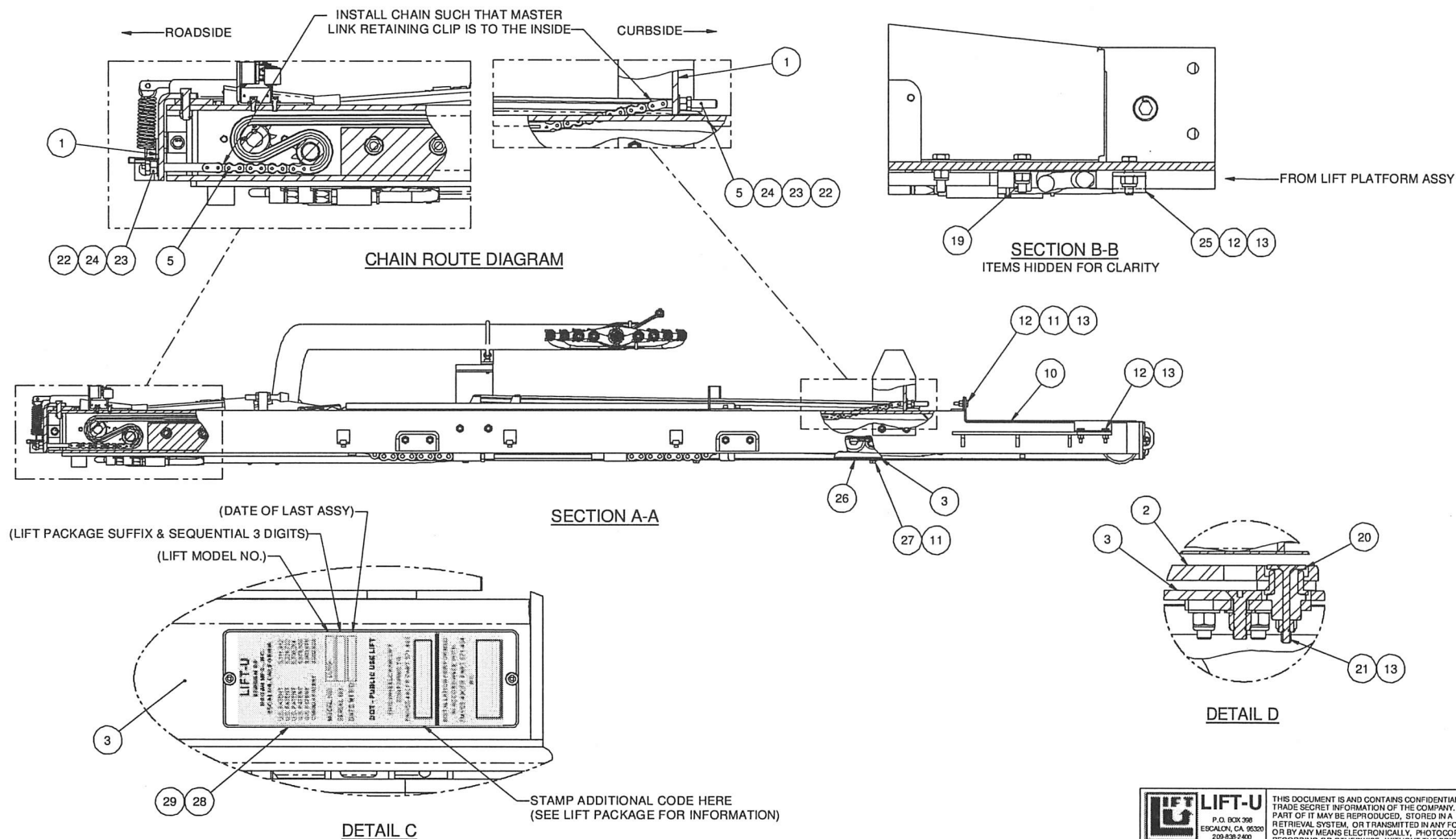
DESC: NONE
SPEC: NONE
FIRST USE REFERENCE: LU10-61
SCALE: 1:5
WEIGHT: 1006.74 (LBS)



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TITLE LIFT ASSEMBLY
DOCUMENT NO. 189-0239
SHEET NO. 1 OF 2
REVISION B

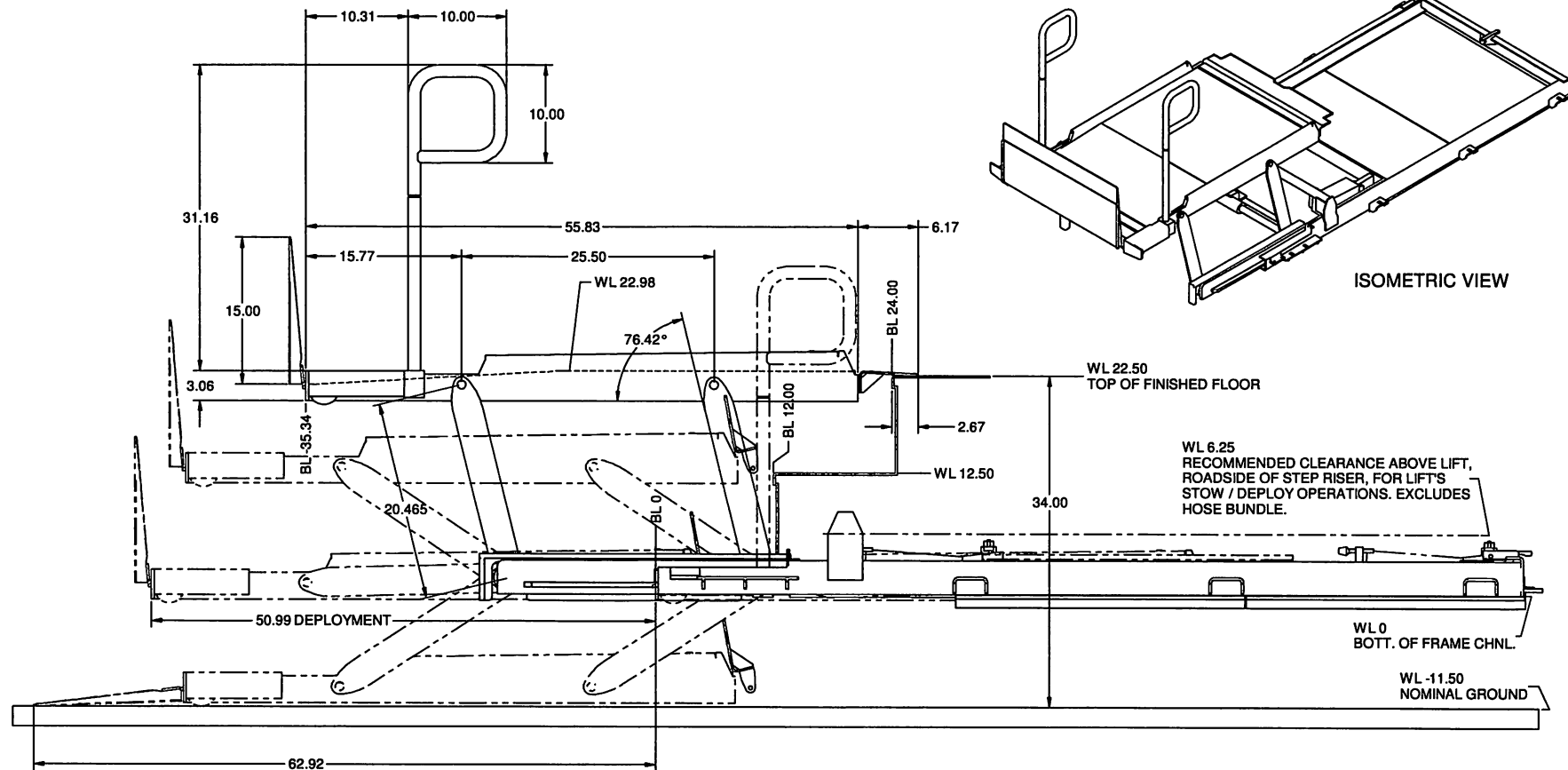


1. STAMP MODEL NO., SERIAL NO. AND DATE OF MANUFACTURE (ADDITIONAL CODE IF REQUIRED) AS SHOWN USING 1/8 HIGH CHARACTERS.
2. PEEL ADHESIVE BACKING OFF ITEM 28 AND PLACE AS SHOWN.
3. MATCH DRILL 2 HOLES .129/.133 DIA AND INSTALL ITEM 29 PER MANUFACTUER SPEC.


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		<b>TITLE</b> <b>LIFT ASSEMBLY</b>	
<b>DOCUMENT NO.</b> 189-0239	<b>SHEET NO.</b> 2 OF 2	<b>REVISION</b> B	

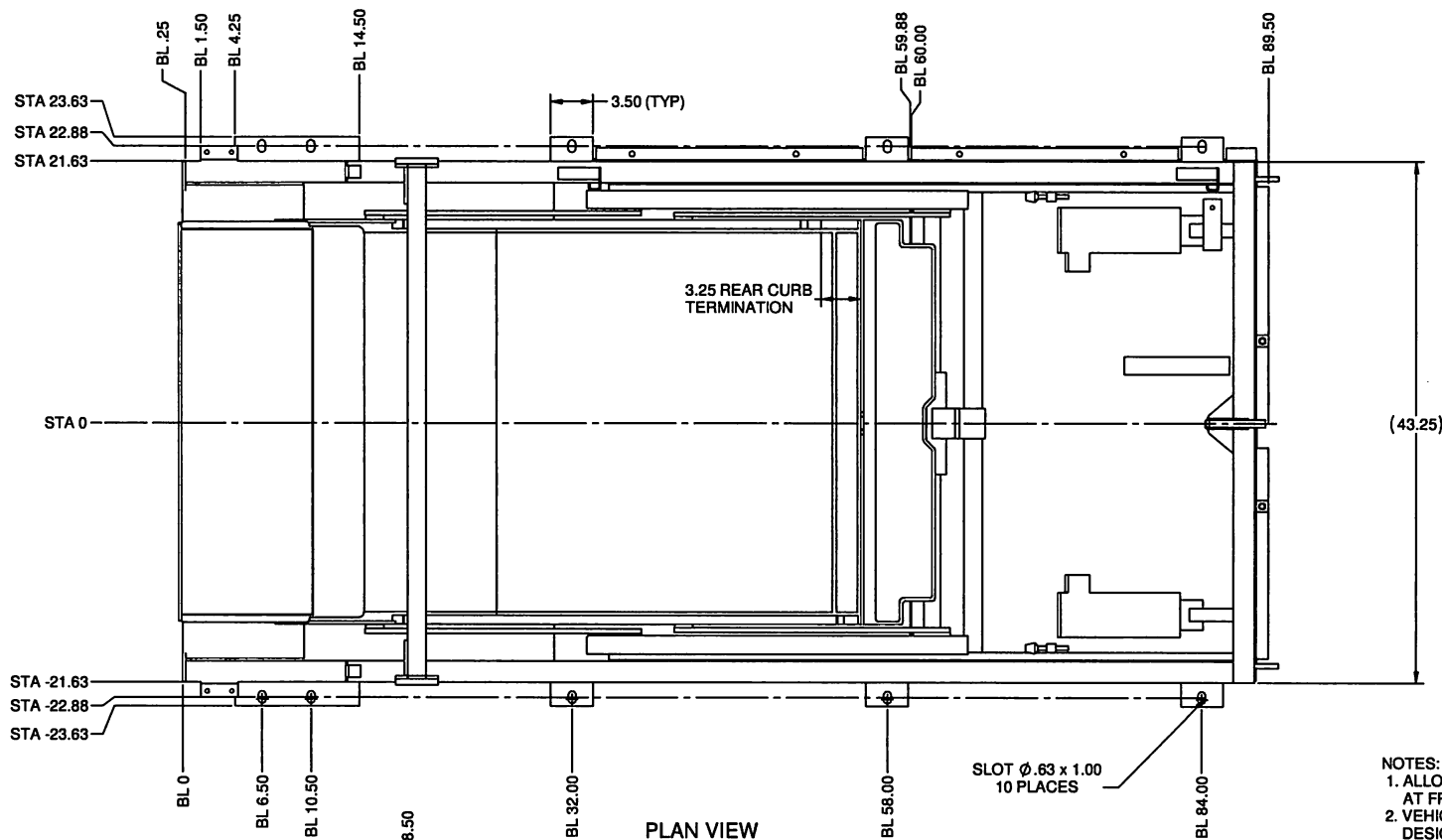
Part Number	Revision	Description
189-0239	B	LIFT ASSEMBLY

ITEM	QTY	P/N	DESCRIPTION
1	1	181-0087	MAIN FRAME ASSEMBLY
2	1	185-0165	POWER PLATFORM ASSY
3	1	183-0118	LIFT PLATFORM ASSEMBLY
4	1	188-0151	POWER HARNESS, CONTROL/BHD
5	2	D55-8427	STOW/DEPLOY CHAIN ASSEMBLY
6	1	D39-2773	CHAIN GUARD WELDMENT, FORWARD
7	1	D39-2779	CHAIN GUARD WELDMENT, REAR
8	2	D34-5322	LIMIT SWITCH TRIP
9	1	D33-8696	CHANNEL CLOSEOUT, FORWARD
10	1	D33-9701	CHANNEL CLOSEOUT, REAR
11	16	426-9104	SAE WASHER, SST
12	8	411-9408	HEX HD CAP SCREW,SST
13	12	423-9452	NYL INSR LOCKNUT, LT, SST
14	6	413-9514	HEX SOC FLAT HD CAP SCREW, SST
15	6	426-4004	CTSK EXT TR LOCKWASHER
16	4	426-9102	SAE WASHER, SST
17	4	427-0202	HLCL SPR LOCKWASHER, SST
18	4	412-9254	HEX SOC HD CAP SCREW, SST
19	1	437-0052	LOOP CLAMP <REPLACES 437-0001, -0056>
20	4	429-0073	RETAINING WASHER
21	4	413-9416	HEX SOC FLAT HD CAP SCREW, SST
22	4	426-9106	SAE WASHER, SST <REPLACES 426-2122>
23	4	422-9801	HEX NUT
24	4	422-9853	HEX JAM NUT, SST
25	1	D36-6205	HOSE/CABLE CLAMP
26	1	123-1015	LIFT PLATFORM COVER PLATE
27	14	411-9456	HEX HD CAP SCREW, SST
28	1	102-0172	LU10 CERTIFICATION LABEL
29	2	440-0035	SST BLIND RIVET
30	1	437-0074	U-BOLT, W/NUT; SST
31	2	423-9701	NYL INSR LOCKNUT, LT
32	2	422-9502	HEX NUT

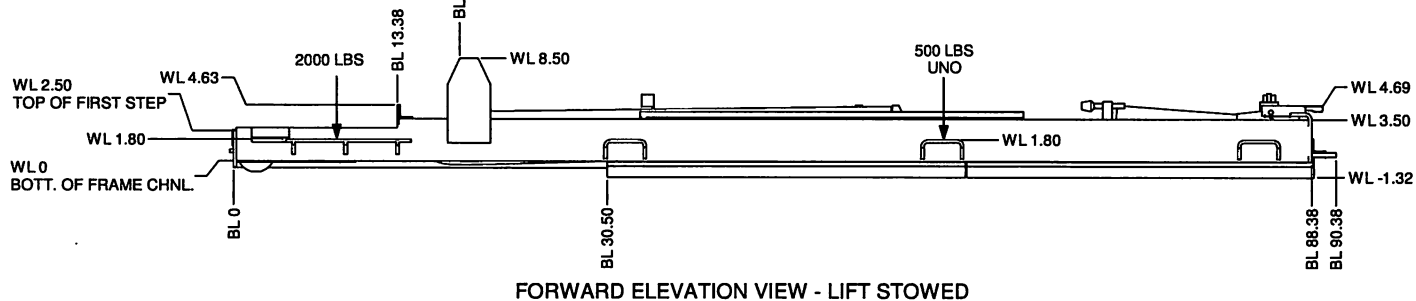


FORWARD ELEVATION VIEW - LIFT KINEMATIC  
(HANDRAIL NOT SHOWN IN ALL POSITIONS FOR CLARITY)

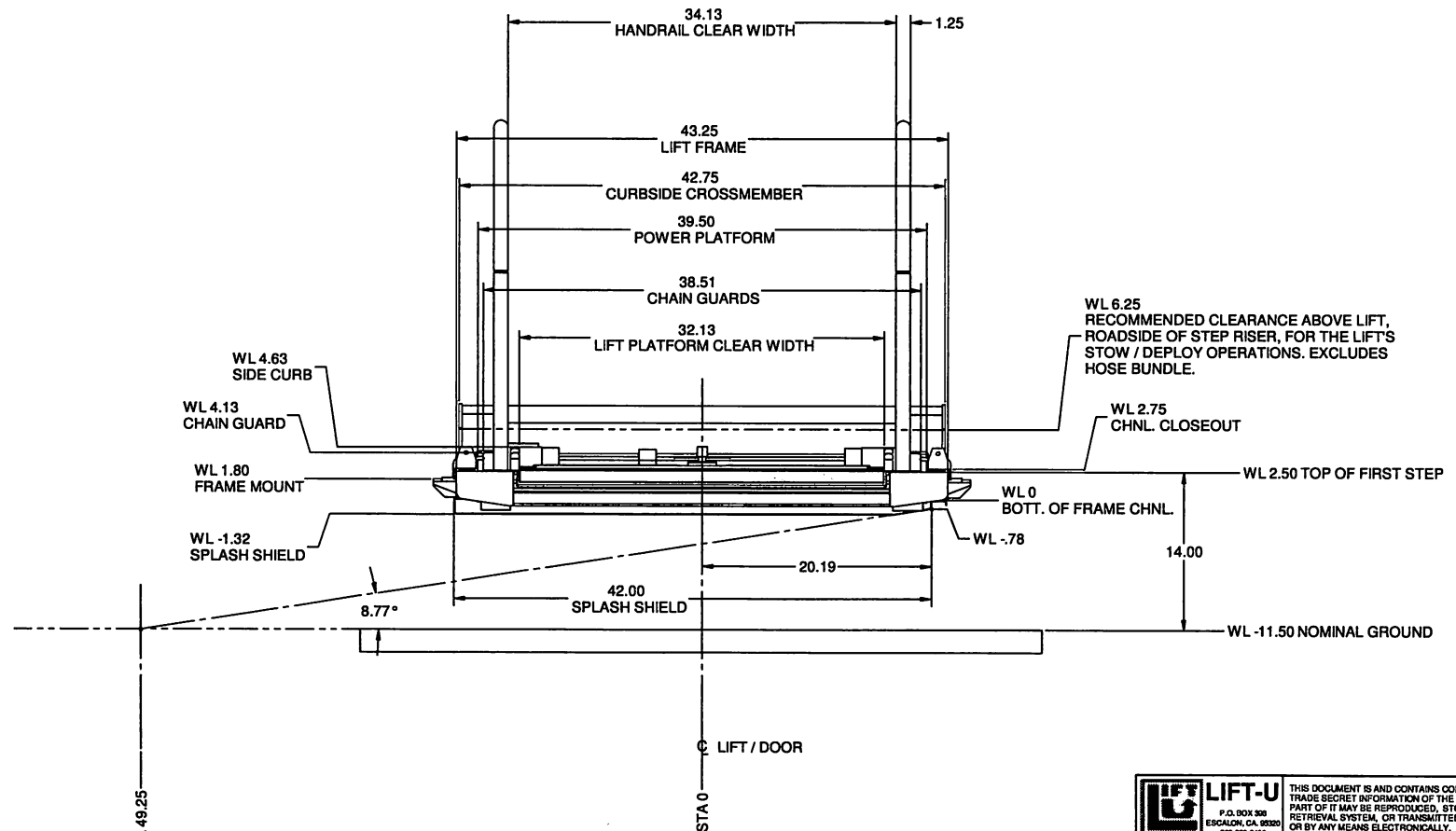
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<b>TITLE</b> LIFT OPERATION/ENVELOPE		
<b>DOCUMENT NO.</b> 199-0061	<b>SHEET NO.</b> 1 OF 3	<b>REVISION</b> A




- NOTES:
1. ALLOW 3/8" MINIMUM FOR SHIMMING AT FRAME MOUNTS.
  2. VEHICLE LIFT BRACKETS MUST BE DESIGNED TO SUPPORT:
    - a) 2000 LBS AT EACH CURBSIDE MOUNTING BRACKET, AND
    - b) 500 LBS EACH AT ALL OTHER MOUNTING BRACKETS

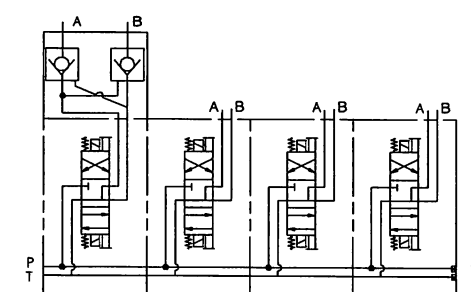
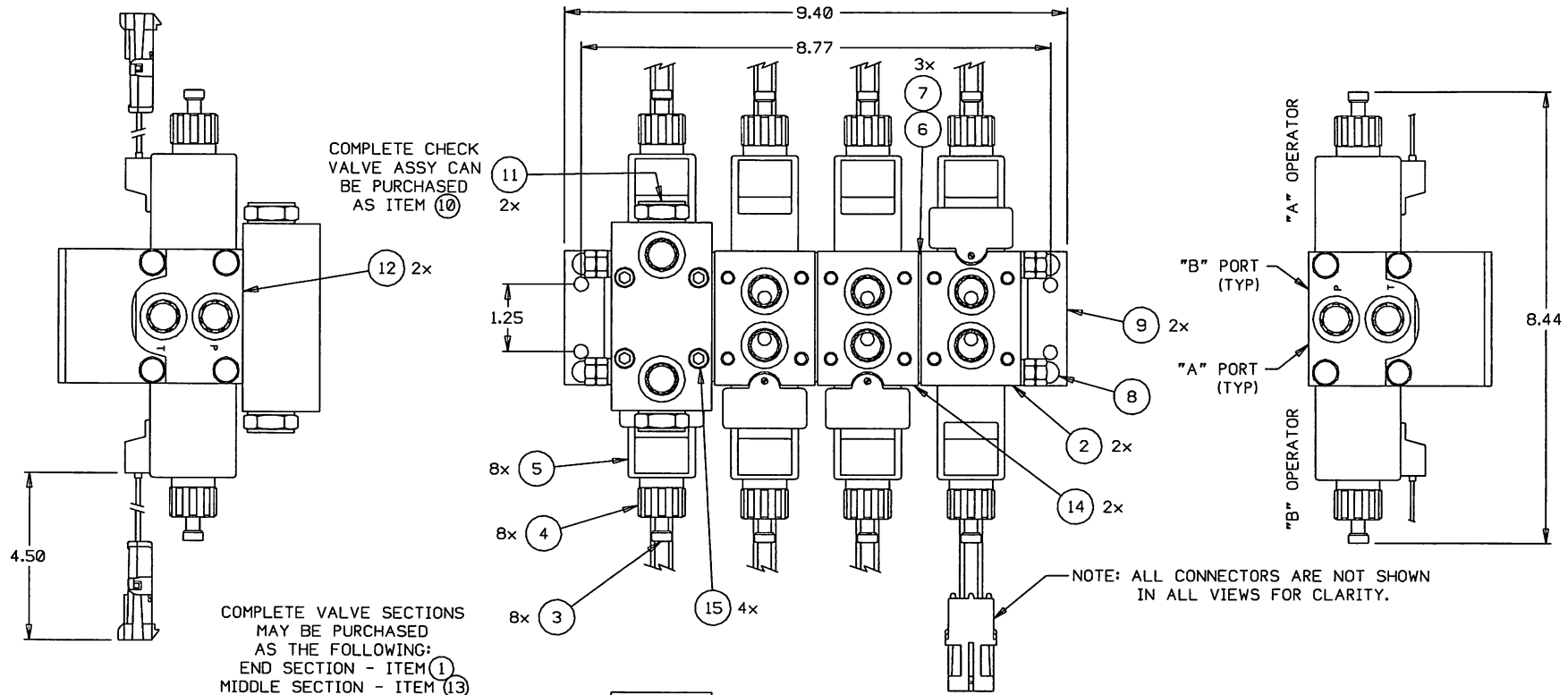


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	<p><b>TITLE</b> LIFT OPERATION/ENVELOPE</p>	
<p><b>DOCUMENT NO.</b> 199-0061</p>	<p><b>SHEET NO.</b> 2 OF 3</p>	<p><b>REVISION</b> A</p>



CURBSIDE ELEVATION VIEW - LIFT STOWED

 <b>LIFT-U</b> <small>P.O. BOX 300          ESCALON, CA 95320          209-325-0400</small>	<small>THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.</small>	
	<small>A DIVISION OF</small> <b>HOGAN MFG., INC.</b>	
<b>TITLE</b> LIFT OPERATION/ENVELOPE		
<small>DOCUMENT NO.</small> 199-0061	<small>SHEET NO.</small> 3 OF 3	<small>REVISION</small> A



SCHMATIC

NOTE: TORQUE ALL FASTENERS TO 80 IN-LB.



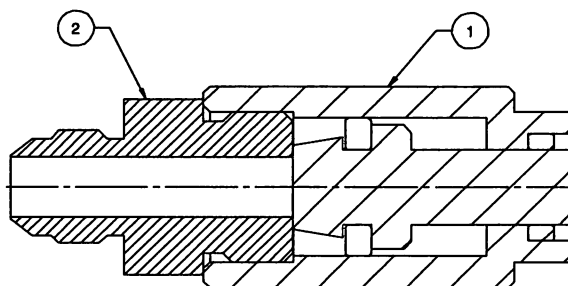
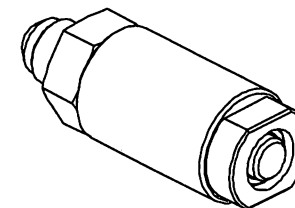
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BANKABLE VALVE ASSY, 24V  
D62-4650  
Rev B

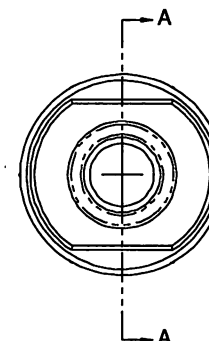
Part Number	Revision	Description
D62-4650	B	BANKABLE VALVE ASSY, 24V

ITEM	QTY	P/N	DESCRIPTION
1	N/A	211-0143	END BANKABLE VALVE SECTION, 24V
2	2	211-0126	END VALVE BODY (W/SPOOL)
3	8	211-0127	SOLENOID TUBE
4	8	211-0128	SOLENOID NUT
5	8	211-0145	SOLENOID COIL, 24V
6	3	211-0130	SECTION PLATE
7	3	211-0131	SECTION O-RING KIT (2 PER KIT)
8	1	211-0132	TIE-ROD KIT (4 W/NUTS & WASHERS)
9	2	211-0133	ANGLE BRACKET
10	N/A	211-0134	DOUBLE P.O. CHECK VALVE ASSY
11	2	211-0136	CHECK VALVE CARTRIDGE
12	2	211-0137	STACK O-RING KIT (2 PER KIT)
13	N/A	211-0144	MIDDLE BANKABLE VALVE SECTION, 24V
14	2	211-0141	MIDDLE VALVE BODY (W/SPOOL)
15	4	412-9464	HSKCS; 1/4-20,1 3/4"L, BLANK OZIDE






SECTION A-A

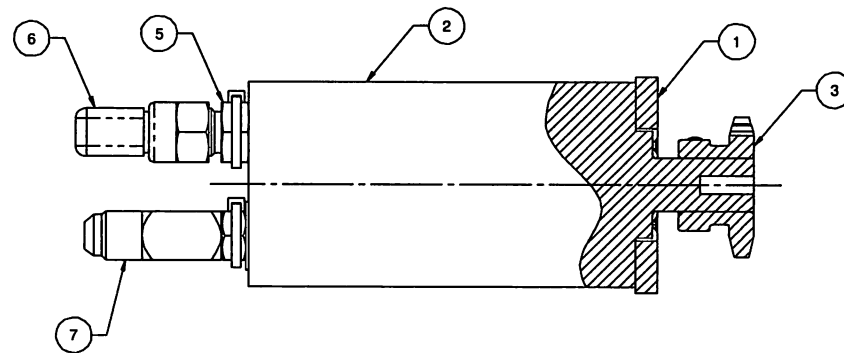
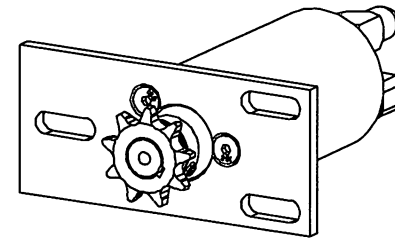
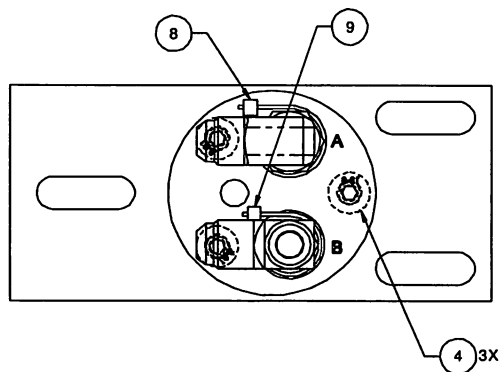



NOTE:  
CAP ALL OPEN FITTINGS FOR  
STORAGE AND/OR SHIPPING.

<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>		 <b>LIFT-U</b> P.O. BOX 398 ESCALON, CA 95320 209-538-2400  A DIVISION OF <b>HOGAN MFG., INC.</b>	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.
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DECIMAL:                      FRACTION: 1/16 X.X     = .00 X.XX    = .010 X.XXX   = .0005		FIRST USE REFERENCE:  9035			
ANGLE: 1/2 DEGREE		SCALE: 1:0.3	WEIGHT: (LBS) 0.4049		
				TITLE <b>LATCH CYLINDER ASSEMBLY</b>	
				DOCUMENT NO. <b>D62-8210</b>	SHEET NO. <b>1 OF 1</b>
					REVISION <b>D</b>

Part Number	Revision	Description
D62-8210	D	LATCH CYLINDER ASSY

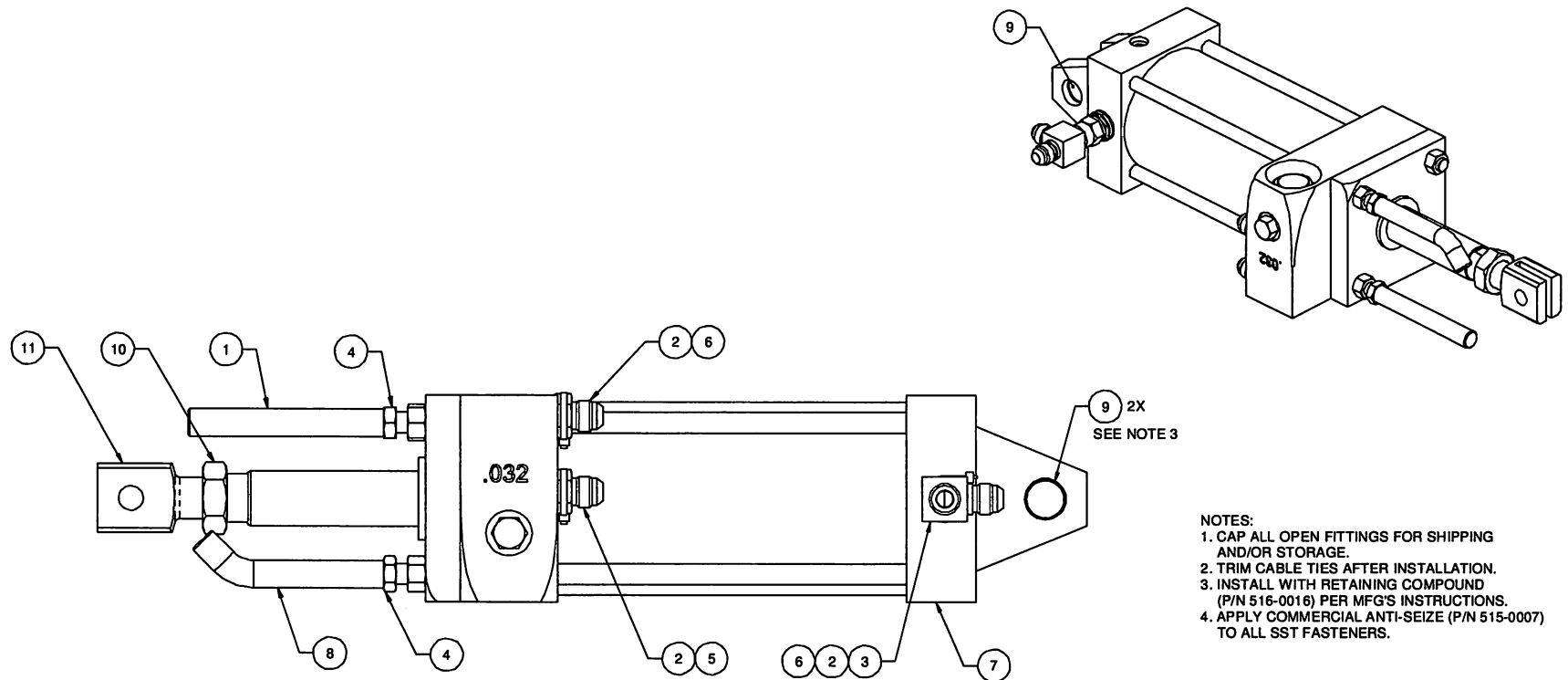
ITEM	QTY	P/N	DESCRIPTION
1	1	214-0086	LATCH CYLINDER
2	1	234-1168	HYDR FITTING




UNLESS OTHERWISE SPECIFIED:		COATING / FINISH	
INTERPRET DRAWING PER ANSI Y14.5-1982. DIMENSIONS ARE IN INCHES. FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45° TOLERANCES (+ OR -): DECIMAL: FRACTION: 1/16 .XX = .03 .XXX = .010 .XXXX = .0005 ANGLE: 1/2 DEGREE		DESC: NONE SPEC: NONE	
FIRST USE REFERENCE:		185-0163	
SCALE: 1:0.7		WEIGHT: 6.94 (LBS.)	
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DOCUMENT NO. 272-0087		TITLE <b>DRIVE MOTOR ASSEMBLY</b>	
SHEET NO. 1 OF 1		REVISION A	

Part Number	Revision	Description
272-0087	A	DRIVE MOTOR ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	D39-2499	MOTOR ADAPTER
2	1	D63-6887	HYD MOTOR
3	1	D45-1878	KEYED SPROCKET
4	3	413-9404	HEX SOC FLAT HD CAP SCREW
5	1	D64-2325	RESTRICTIVE FITTING ASSY
6	1	234-3466	HYD FITTING
7	1	234-8168	HYD FITTING
8	1	436-0002	CABLE TIE, WHT
9	1	436-0008	CABLE TIE, BLK

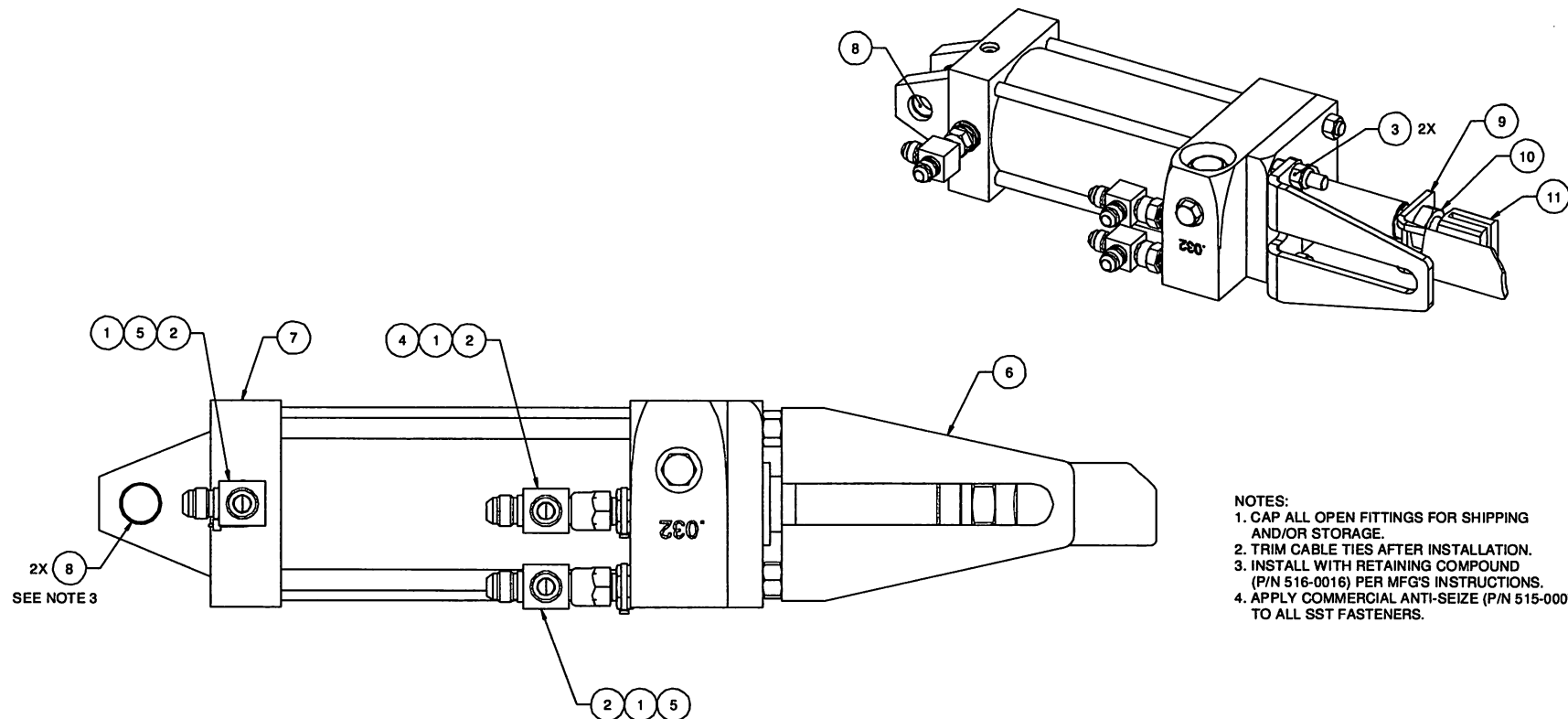


- NOTES:
1. CAP ALL OPEN FITTINGS FOR SHIPPING AND/OR STORAGE.
  2. TRIM CABLE TIES AFTER INSTALLATION.
  3. INSTALL WITH RETAINING COMPOUND (P/N 516-0016) PER MFG'S INSTRUCTIONS.
  4. APPLY COMMERCIAL ANTI-SEIZE (P/N 515-0007) TO ALL SST FASTENERS.


<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>		 <b>LIFT-U</b> P.O. BOX 398 ESCALON, CA. 95320 209-438-2400  A DIVISION OF <b>HOGAN MFG., INC.</b>	<p>THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.</p>
- INTERPRET DRAWING PER ANSI Y14.5-1992. - DIMENSIONS ARE IN INCHES. - FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. - DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. - DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45° - TOLERANCES (+ OR -):		<b>DESC:</b> NONE  <b>SPEC:</b> NONE  <b>FIRST USE REFERENCE:</b>  <b>LU10</b>			
DECIMAL: .XX = .03 .XXX = .010 .XXXX = .0005		FRACTION: 1/16  ANGLE: 1/2 DEGREE			
<b>SCALE:</b> 1:1		<b>WEIGHT:</b> (LBS.)			
<b>DOCUMENT NO.</b> 272-0088		<b>SHEET NO.</b> 1 OF 1		<b>REVISION</b> B	

Part Number	Revision	Description
272-0088	B	LIFT CYLINDER ASSY, FORWARD

ITEM	QTY	P/N	DESCRIPTION
1	1	D39-2473	SLACK CHAIN TRIP
2	3	234-1164	HYD FITTING
3	1	234-8466	HYD FITTING
4	2	422-9653	HEX JAM NUT, SST
5	1	436-0006	CABLE TIE, ORN
6	2	436-0007	CABLE TIE, BRN
7	1	214-0125	HYDRAULIC CYLINDER
8	1	D40-9071	HOSE BUNDLE GUIDE
9	2	D45-1626	SLEEVE BEARING
10	1	422-9901	HEX JAM NUT, SST
11	1	D12-5095	LIFT CHAIN CONNECTOR



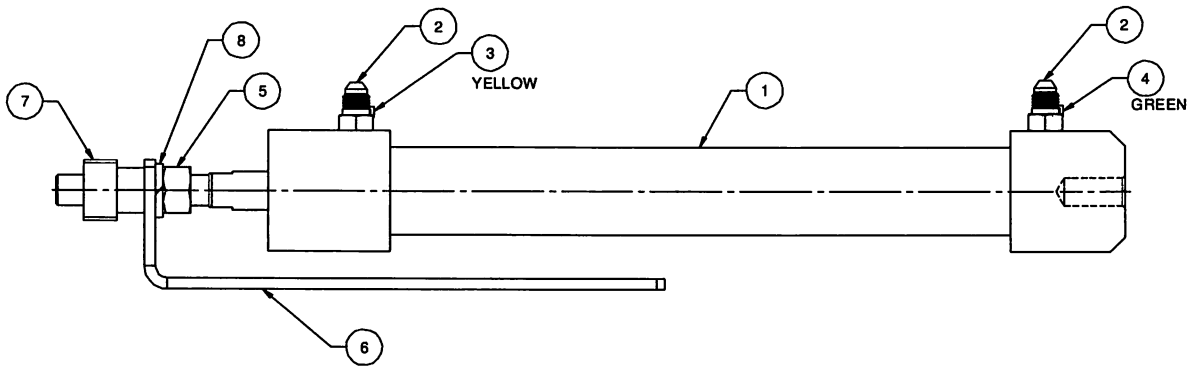
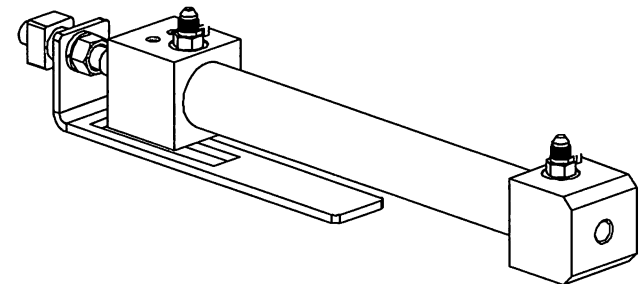
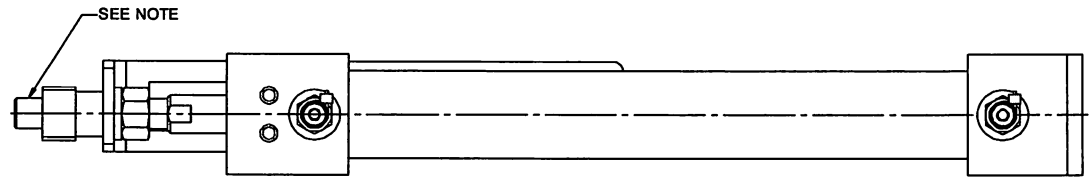
- NOTES:
1. CAP ALL OPEN FITTINGS FOR SHIPPING AND/OR STORAGE.
  2. TRIM CABLE TIES AFTER INSTALLATION.
  3. INSTALL WITH RETAINING COMPOUND (P/N 516-0016) PER MFGS INSTRUCTIONS.
  4. APPLY COMMERCIAL ANTI-SEIZE (P/N 515-0007) TO ALL SST FASTENERS.

UNLESS OTHERWISE SPECIFIED:		COATING / FINISH	
- INTERPRET DRAWING PER ANSI Y14.5-1982. - DIMENSIONS ARE IN INCHES. - FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. - DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. - DEBURR ALL SURFACES AND BREAK ALL EDGES .015 ± .45° - TOLERANCES (+ OR -): DECIMAL:                      FRACTION: 1/16 XX     = .03                      ANGLE: 1/2 DEGREE XXX    = .010 XXXX   = .0005		DESC: NONE	
		SPEC: NONE	
		FIRST USE REFERENCE:	LU10
		SCALE: 1:1	WEIGHT: (LBS.)
		<div>  <b>LIFT-U</b>            P.O. BOX 380            ESCALON, CA. 95320            209-638-2400            A DIVISION OF  <b>HOGAN MFG., INC.</b> </div>	
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		<b>TITLE</b> <b>LIFT CYLINDER ASSEMBLY, REAR</b>	
		DOCUMENT NO. 272-0089	SHEET NO. 1 OF 1 REVISION B


Part Number	Revision	Description
272-0089	B	LIFT CYLINDER ASSY, REAR

ITEM	QTY	P/N	DESCRIPTION
1	3	234-1164	HYD FITTING
2	3	234-8466	HYD FITTING
3	2	423-9651	NYL INSR LOCKNUT, LT, SST
4	1	436-0006	CABLE TIE, ORN
5	2	436-0007	CABLE TIE, BRN
6	1	D40-9060	PROXIMITY SWITCH MOUNT
7	1	214-0125	HYDRAULIC CYLINDER
8	2	D45-1626	SLEEVE BEARING
9	1	D40-1158	TARGET, STOW LEVEL/FLOOR HT
10	1	422-9901	HEX JAM NUT, SST



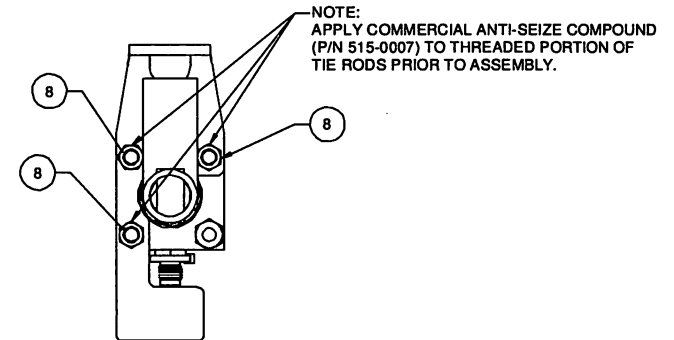
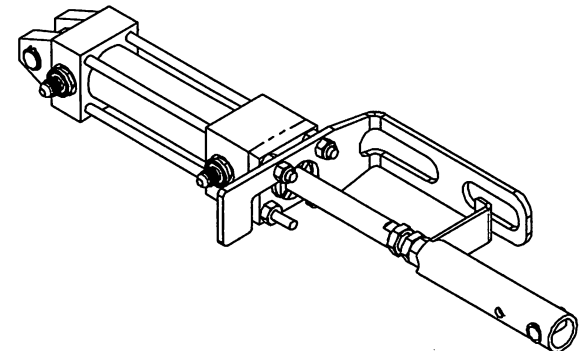
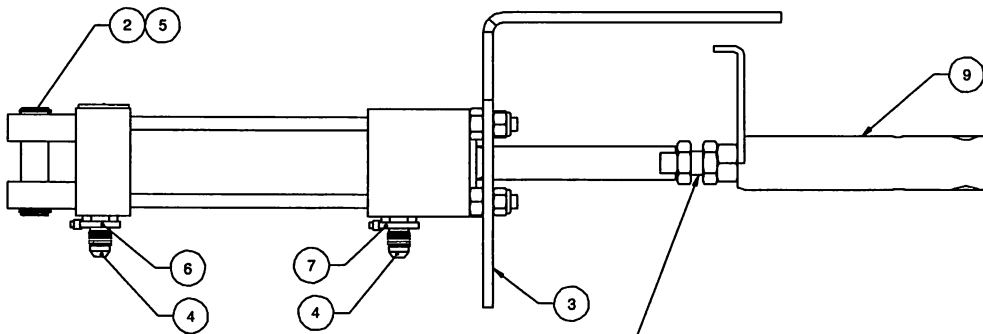
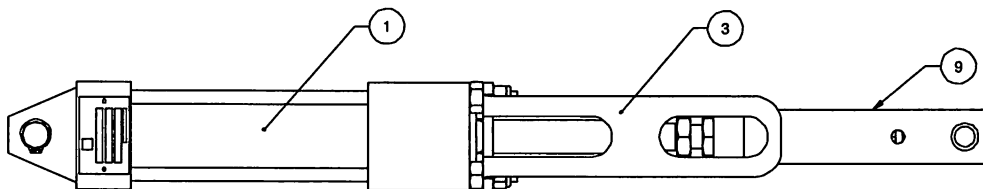


NOTE:  
APPLY COMMERCIAL ANTI-SEIZE COMPOUND  
(P/N 515-0007) TO THREADED PORTION OF  
CYLINDER ROD PRIOR TO ASSEMBLY.

<b>UNLESS OTHERWISE SPECIFIED:</b>		<b>COATING / FINISH</b>		 <div><b>LIFT-U</b> P.O. BOX 399 ESCALON, CA. 95820 209-438-2402</div> <div>A DIVISION OF <b>HOGAN MFG., INC.</b></div> <div>THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.</div>
<ul style="list-style-type: none"><li>- INTERPRET DRAWING PER ANSI Y14.5-1982.</li><li>- DIMENSIONS ARE IN INCHES.</li><li>- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.</li><li>- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.</li><li>- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45°</li><li>- TOLERANCES (+ OR -):</li></ul>		<b>DESC:</b> NONE		
		<b>SPEC:</b> NONE		
		<b>FIRST USE REFERENCE:</b> 183-0114		
DECIMAL:                      FRACTION: 1/16 .XX     = .03 .XXX    = .010 .XXXX   = .0005 ANGLE: 1/2 DEGREE		<b>SCALE:</b> 1:1 <b>WEIGHT:</b> (LBS)		
<b>TITLE</b> RAMP CYLINDER ASSEMBLY				
<b>DOCUMENT NO.</b> 273-0066				
<b>SHEET NO.</b> 1 OF 1				
<b>REVISION</b> C				


Part Number	Revision	Description
273-0066	C	RAMP CYLINDER ASSEMBLY

ITEM	QTY	P/N	DESCRIPTION
1	1	D62-8356	RAMP/BARRIER CYLINDER
2	2	234-1144	HYD FITTING
3	1	436-0003	CABLE TIE, YEL
4	1	436-0004	CABLE TIE, GRN
5	1	422-9801	HEX NUT, SST
6	1	123-0989	RAMP BARRIER TARGET
7	1	123-0970	T-NUT
8	1	427-0208	HLCL SPR LOCKWASHER



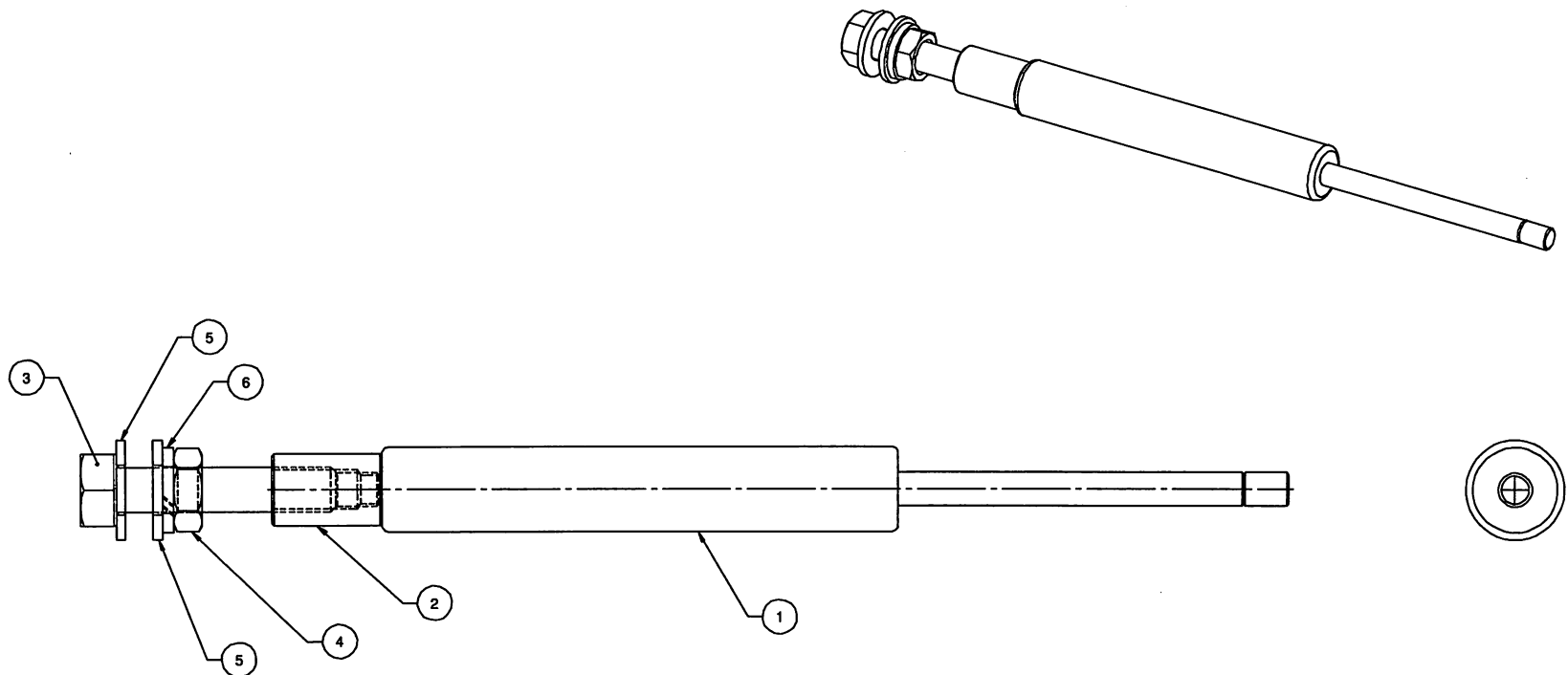
APPLY COMMERCIAL ANTI-SEIZE  
(P/N 515-0007) TO THREADED PORTION  
OF ITEM 9 BEFORE ASSEMBLY

NOTE:  
APPLY COMMERCIAL ANTI-SEIZE COMPOUND  
(P/N 515-0007) TO THREADED PORTION OF  
TIE RODS PRIOR TO ASSEMBLY.

UNLESS OTHERWISE SPECIFIED:		COATING / FINISH		 <div>LIFT-U P.O. BOX 308 ESCALON, CA 95320 209-639-2400</div> <div>A DIVISION OF HOGAN MFG., INC.</div>	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPYING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
- INTERPRET DRAWING PER ANSI Y14.5-1982. - DIMENSIONS ARE IN INCHES. - FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. - DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. - DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45° - TOLERANCES (+ OR -):		DESC: NONE	SPEC: NONE			
DECIMAL:                      FRACTION: 1/16 .XX     = .03 .XXX    = .010 .XXXX   = .0005		FIRST USE REFERENCE: 183-0114				
SCALE: 1:1.125		WEIGHT: (LBS.) 6.8468	TITLE BRIDGE CYLINDER ASSEMBLY			
		DOCUMENT NO. 273-0067	SHEET NO. 1 OF 1	REVISION C		


Part Number	Revision	Description
273-0067	C	BRIDGE CYLINDER ASSY

ITEM	QTY	P/N	DESCRIPTION
1	1	D62-8270	HYD CYL
2	1	123-0985	CLEVIS PIN
3	1	123-0986	BRIDGE CYLINDER PROX MOUNT
4	2	234-1144	HYD FITTING
5	2	432-0810	RETAINING RING
6	1	436-0013	CABLE TIE, PURPLE
7	1	436-0014	CABLE TIE, GRAY
8	3	423-9452	NYL INSR LOCKNUT, LT, SST
9	1	123-1004	ROD END ASSY



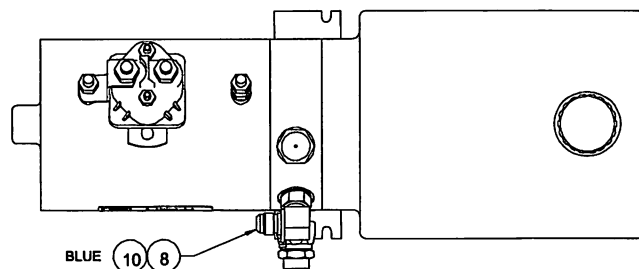
**NOTES:**

1. APPLY RED LOCTITE (P/N 516-0010) TO ITEM 1 PRIOR TO ASSEMBLY OF ITEM 2.
2. APPLY COMMERCIAL ANTI-SEIZE (P/N 515-0007) TO ITEM 3 PRIOR TO ASSEMBLY.

UNLESS OTHERWISE SPECIFIED:		COATING / FINISH		 <b>LIFT-U</b> P.O. BOX 328 ESCALON, CA. 95320 202-838-2400	THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.
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DECIMAL: .XX = .03 .XXX = .010 .XXXX = .0005		FRACTION: 1/16  ANGLE: 1/2 DEGREE			
FIRST USE REFERENCE:		183-0114		A DIVISION OF <b>HOGAN MFG., INC.</b>	TITLE  <b>GAS SPRING ASSEMBLY</b>
SCALE: 1:0.4		WEIGHT: 0.3614 (LBS)			
				SHEET NO. 1 OF 1	REVISION D

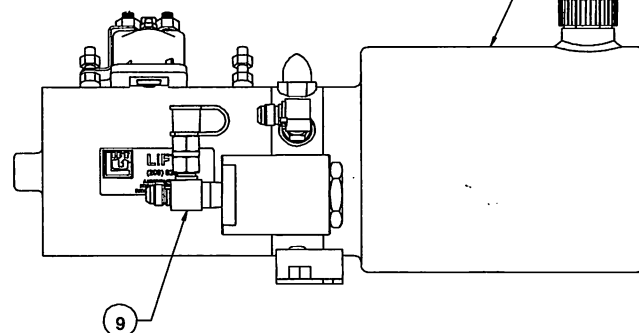
Part Number	Revision	Description
273-0068	D	GAS SPRING ASSEMBLY

ITEM	QTY	P/N	DESCRIPTION
1	1	273-0068	GAS SPRING, 70 lb.
2	1	123-0996	COUPLING NUT, GAS SPRING
3	1	411-9512	HEX HD CAP SCREW, SST (FULL THREAD)
4	1	422-2506	HEX JAM NUT, SST
5	2	426-9105	SAE WASHER, SST
6	1	427-0205	HLCL SPR LOCKWASHER, SST

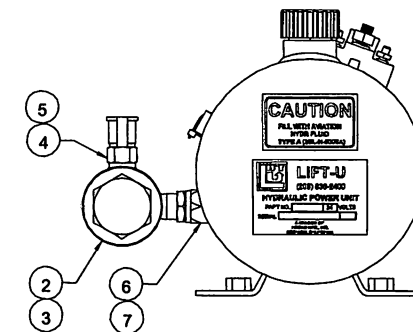


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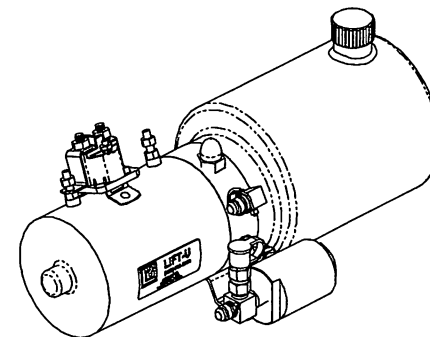
RED 11



PLUG FOR SHIPPING  
(BREATHER CAP/DIPSTICK ASSY  
SUPPLIED WITH ITEM 1)




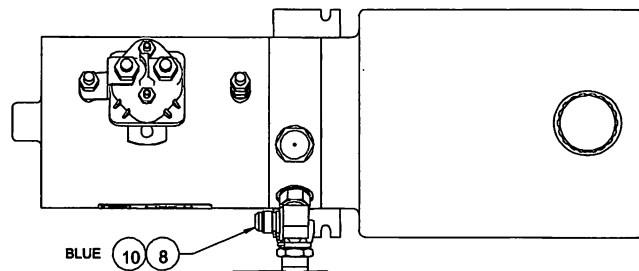
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# NOTES:

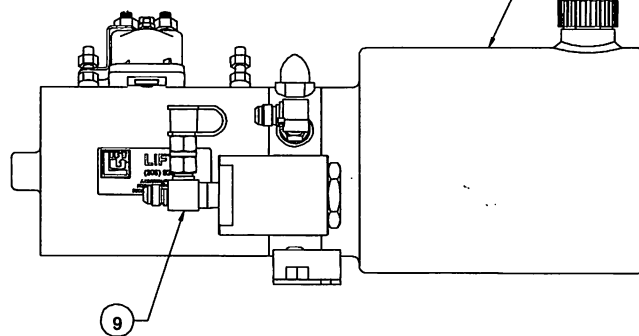
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2. TRIM CABLE TIES AFTER INSTALLATION.
3. CAP OPEN FITTINGS FOR SHIPPING AND/OR STORAGE.

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A DIVISION OF <b>HOGAN MFG., INC.</b>		
TITLE <b>HYDRAULIC POWER UNIT ASSY, 24V</b>		
DOCUMENT NO. <b>D80-1483</b>	SHEET NO. <b>1 OF 1</b>	REVISION <b>D</b>



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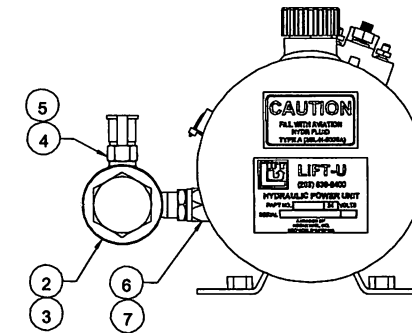
RED 11



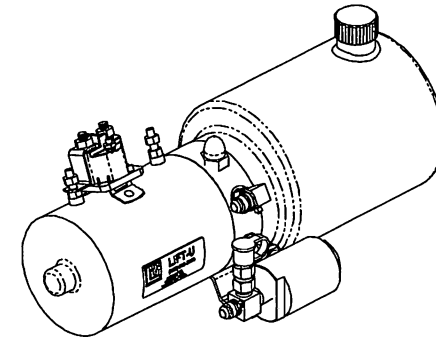
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PLUG FOR SHIPPING  
(BREATHER CAP/DIPSTICK ASSY  
SUPPLIED WITH ITEM 1)

1



2 3  
FILTER  
INSIDE



- NOTES:
1. DIMENSIONS ARE NOMINAL, AND SHOWN FOR REFERENCE ONLY.
  2. TRIM CABLE TIES AFTER INSTALLATION.
  3. CAP OPEN FITTINGS FOR SHIPPING AND/OR STORAGE.

**LIFT-U**  
ESCALON,  
CALIFORNIA  
A DIVISION OF  
**HOGAN MFG., INC.**

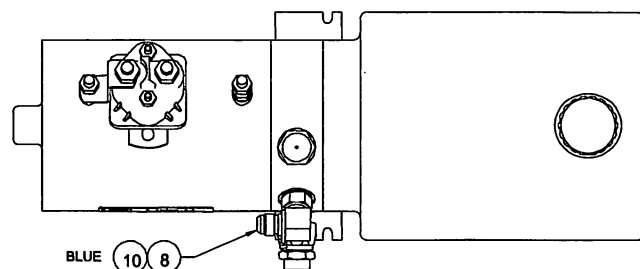
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TITLE HYDRAULIC POWER UNIT ASSY, 24V

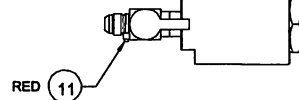
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SHEET NO. 1 OF 1 REVISION D

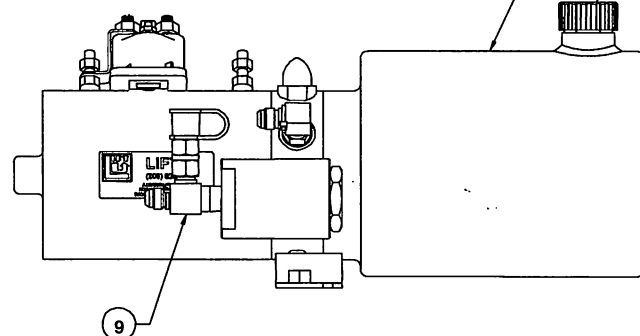




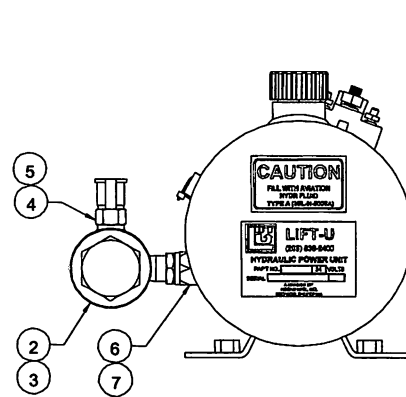
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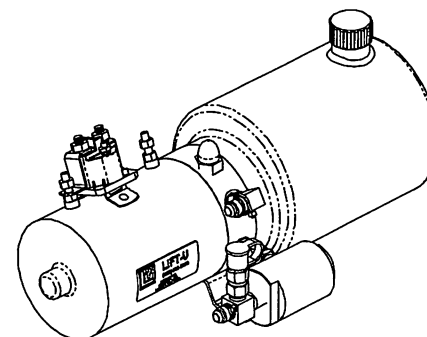
RED 11



PLUG FOR SHIPPING  
(BREATHING CAP/DIPSTICK ASSY  
SUPPLIED WITH ITEM 1)

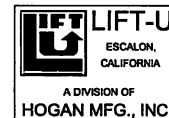


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#### NOTES:

1. DIMENSIONS ARE NOMINAL, AND SHOWN FOR REFERENCE ONLY.
2. TRIM CABLE TIES AFTER INSTALLATION.
3. CAP OPEN FITTINGS FOR SHIPPING AND/OR STORAGE.



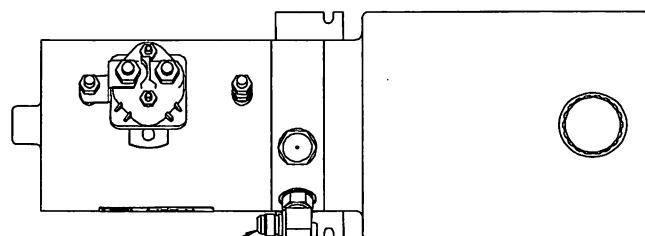
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TITLE HYDRAULIC POWER UNIT ASSY, 24V

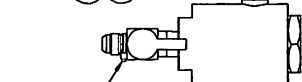
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SHEET NO. 1 OF 1

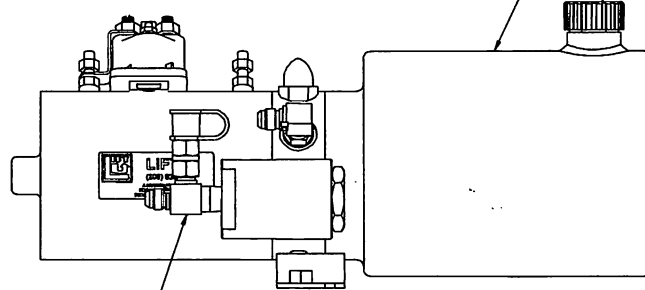
REVISION D



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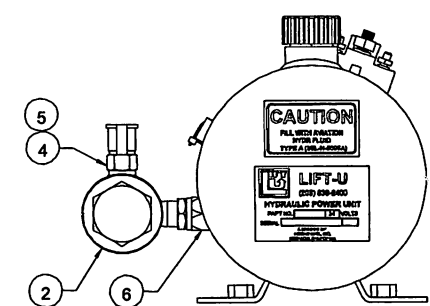
RED 11



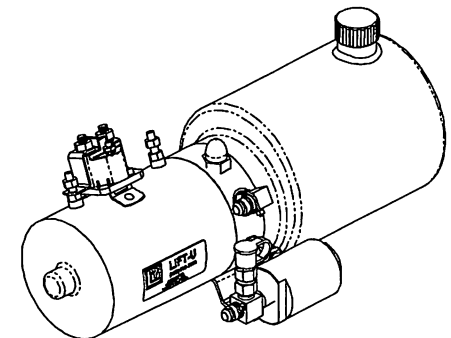
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PLUG FOR SHIPPING  
(BREATHER CAP/DIPSTICK ASSY  
SUPPLIED WITH ITEM 1)


1

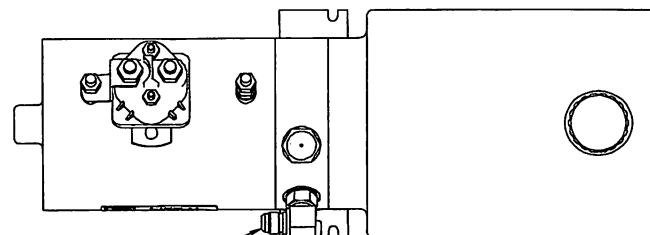


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NOTES:  
1. DIMENSIONS ARE NOMINAL, AND SHOWN  
FOR REFERENCE ONLY.  
2. TRIM CABLE TIES AFTER INSTALLATION.  
3. CAP OPEN FITTINGS FOR SHIPPING AND/OR  
STORAGE.

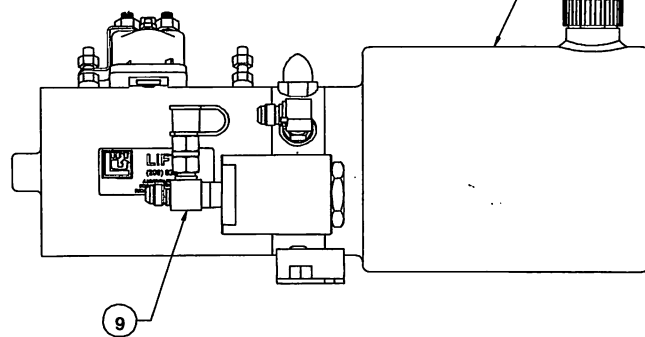
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A DIVISION OF <b>HOGAN MFG., INC.</b>		
<b>TITLE</b> <b>HYDRAULIC POWER UNIT ASSY, 24V</b>		
<b>DOCUMENT NO.</b> <b>D80-1483</b>	<b>SHEET NO.</b> 1 OF 1	<b>REVISION</b> <b>D</b>



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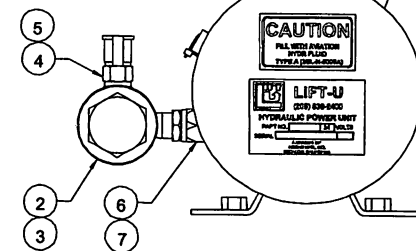
RED 11

PLUG FOR SHIPPING  
(BREATHER CAP/DIPSTICK ASSY  
SUPPLIED WITH ITEM 1)



9

1



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3  
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5

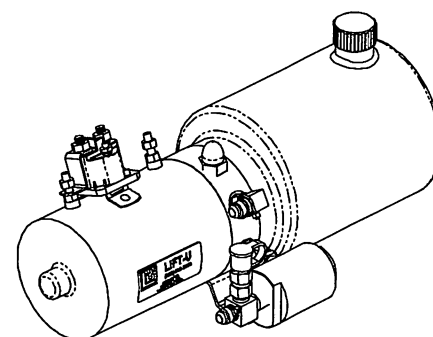
4

2


3

6

7

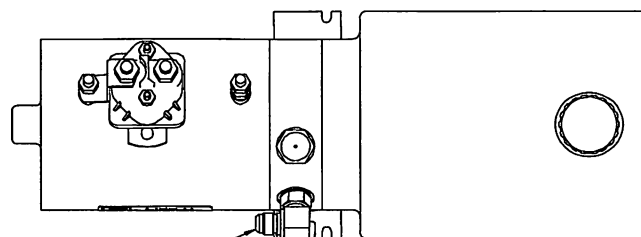


- NOTES:
1. DIMENSIONS ARE NOMINAL, AND SHOWN FOR REFERENCE ONLY.
  2. TRIM CABLE TIES AFTER INSTALLATION.
  3. CAP OPEN FITTINGS FOR SHIPPING AND/OR STORAGE.

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	<b>TITLE</b> HYDRAULIC POWER UNIT ASSY, 24V	
	<b>DOCUMENT NO.</b> D80-1483	<b>SHEET NO.</b> 1 OF 1

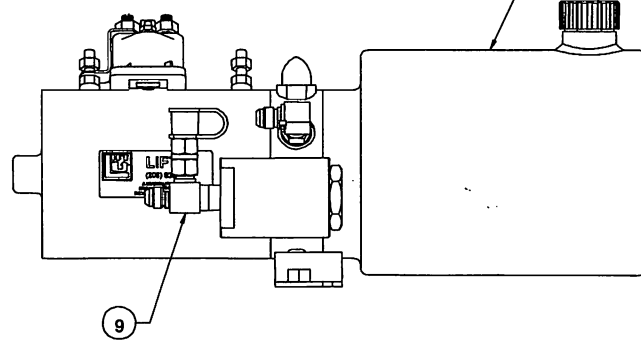
Part Number	Revision	Description
D80-1483	D	HYD PWR UNIT ASSY, 24V

ITEM	QTY	P/N	DESCRIPTION
1	1	D80-1506	LU0 HYDR POWER UNIT, 24V (W/METAL TANK - SET RELIEF
2	1	D62-9259	HYD PRESSURE FILTER, IN-LINE
3	1	D62-9265	FILTER ELEMENT
4	1	D67-9407	QUICK DISCONNECT FITTING
5	1	231-0001	QUICK DISCONNECT CAP
6	1	236-1468	HYD FITTING
7	1	234-1186	HYD FITTING
8	1	234-3166	HYD FITTING
9	1	234-8266	HYD FITTING
10	1	436-0005	CABLE TIE, BLU
11	1	436-0009	CABLE TIE, RED



BLUE (10) (8)

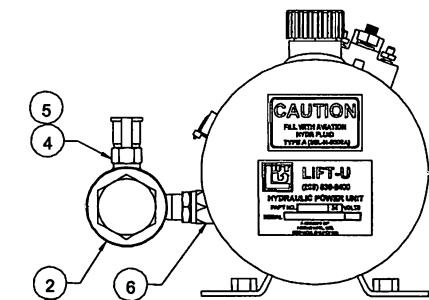
RED (11)



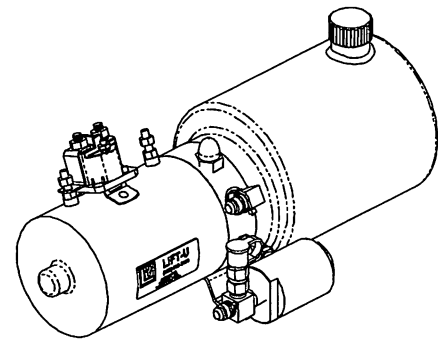
(9)

PLUG FOR SHIPPING  
(BREATHER CAP/DIPSTICK ASSY  
SUPPLIED WITH ITEM 1)


(1)



FILTER  
INSIDE



- NOTES:
1. DIMENSIONS ARE NOMINAL, AND SHOWN FOR REFERENCE ONLY.
  2. TRIM CABLE TIES AFTER INSTALLATION.
  3. CAP OPEN FITTINGS FOR SHIPPING AND/OR STORAGE.

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	<b>TITLE</b> HYDRAULIC POWER UNIT ASSY, 24V	
<b>DOCUMENT NO.</b> D80-1483	<b>SHEET NO.</b> 1 OF 1	<b>REVISION</b> D

Part Number	Revision	Description
D80-1483	D	HYD PWR UNIT ASSY, 24V

ITEM	QTY	P/N	DESCRIPTION
1	1	D80-1506	LU0 HYDR POWER UNIT, 24V (W/METAL TANK - SET RELIEF
2	1	D62-9259	HYD PRESSURE FILTER, IN-LINE
3	1	D62-9265	FILTER ELEMENT
4	1	D67-9407	QUICK DISCONNECT FITTING
5	1	231-0001	QUICK DISCONNECT CAP
6	1	236-1468	HYD FITTING
7	1	234-1186	HYD FITTING
8	1	234-3166	HYD FITTING
9	1	234-8266	HYD FITTING
10	1	436-0005	CABLE TIE, BLU
11	1	436-0009	CABLE TIE, RED

Part Number	Revision	Description
D80-1483	D	HYD PWR UNIT ASSY, 24V

ITEM	QTY	P/N	DESCRIPTION
1	1	D80-1506	LU0 HYDR POWER UNIT, 24V (W/METAL TANK - SET RELIEF
2	1	D62-9259	HYD PRESSURE FILTER, IN-LINE
3	1	D62-9265	FILTER ELEMENT
4	1	D67-9407	QUICK DISCONNECT FITTING
5	1	231-0001	QUICK DISCONNECT CAP
6	1	236-1468	HYD FITTING
7	1	234-1186	HYD FITTING
8	1	234-3166	HYD FITTING
9	1	234-8266	HYD FITTING
10	1	436-0005	CABLE TIE, BLU
11	1	436-0009	CABLE TIE, RED

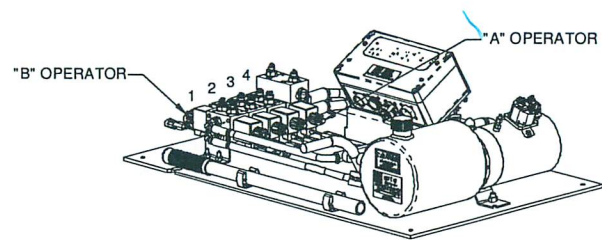
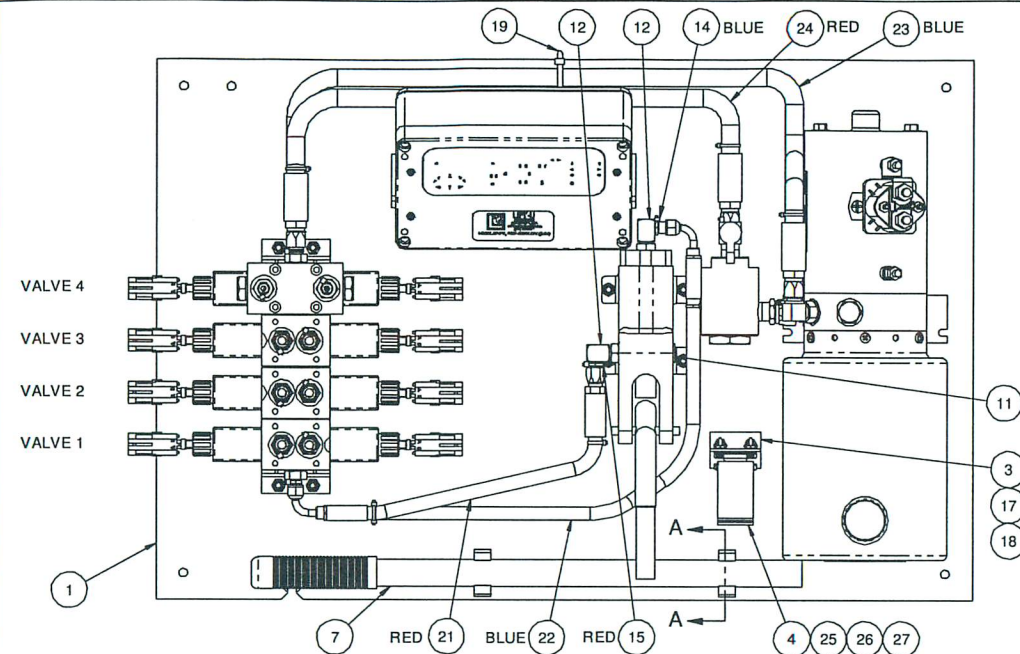
Part Number	Revision	Description
D80-1483	D	HYD PWR UNIT ASSY, 24V

ITEM	QTY	P/N	DESCRIPTION
1	1	D80-1506	LU0 HYDR POWER UNIT, 24V (W/METAL TANK - SET RELIEF
2	1	D62-9259	HYD PRESSURE FILTER, IN-LINE
3	1	D62-9265	FILTER ELEMENT
4	1	D67-9407	QUICK DISCONNECT FITTING
5	1	231-0001	QUICK DISCONNECT CAP
6	1	236-1468	HYD FITTING
7	1	234-1186	HYD FITTING
8	1	234-3166	HYD FITTING
9	1	234-8266	HYD FITTING
10	1	436-0005	CABLE TIE, BLU
11	1	436-0009	CABLE TIE, RED

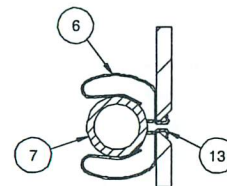


Part Number	Revision	Description
D80-1483	D	HYD PWR UNIT ASSY, 24V

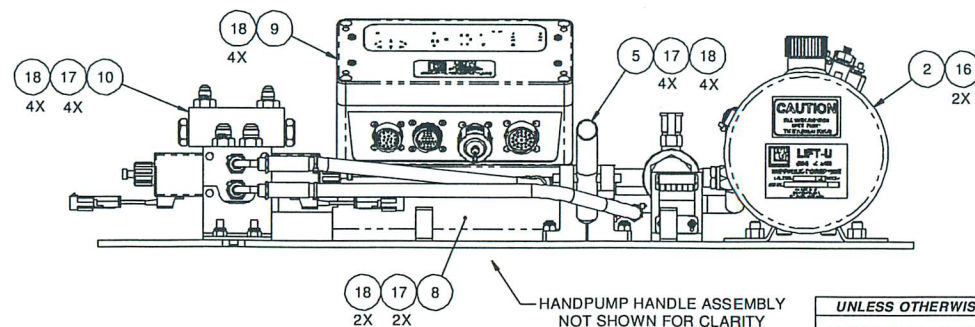
ITEM	QTY	P/N	DESCRIPTION
1	1	D80-1506	LU0 HYDR POWER UNIT, 24V (W/METAL TANK - SET RELIEF
2	1	D62-9259	HYD PRESSURE FILTER, IN-LINE
3	1	D62-9265	FILTER ELEMENT
4	1	D67-9407	QUICK DISCONNECT FITTING
5	1	231-0001	QUICK DISCONNECT CAP
6	1	238-1468	HYD FITTING
7	1	234-1186	HYD FITTING
8	1	234-3166	HYD FITTING
9	1	234-8266	HYD FITTING
10	1	436-0005	CABLE TIE, BLU
11	1	436-0009	CABLE TIE, RED



WIRE COLOR	VALVE	OPERATOR	ACTION	No. (REF)
ORANGE	1	B	DEPLOY LIFT	27
YELLOW	1	A	STOW LIFT	39
BLACK	1	GND	-	31
BROWN	2	B	LOWER LIFT	38
BLUE	2	A	RAISE LIFT	42
BLACK	2	GND	-	31
OPG/BLK	3	B	C/S BARRIER "BARRIER"	30
BLU/BLK	3	A	C/S BARRIER "STEP"	34
BLACK	3	GND	-	31
BLK/RED	4	B	R/S BARRIER "BRIDGE"	63
BRN/BLK	4	A	R/S BARRIER "BARRIER"	66
BLACK	4	GND	-	31
YEL/BLK	-	-	PUMP	22
BLACK	-	-	PUMP	31
RED/BLK	-	-	COUNTER	36



SECTION A-A



- NOTES: UNLESS OTHERWISE SPECIFIED
1. CAP ALL OPEN FITTINGS FOR SHIPPING AND / OR STORAGE.
  2. ATTACH HOSES TO MATCHING CABLE TIE COLORS.
  3. USE WIRING CONNECTION REFERENCE CHART FOR MAKING PROPER VALVE CONNECTIONS.
  4. ELECTRICAL CABLE AND CONECTORS (ITEM 20) ARE NOT SHOWN FOR CLARITY.

UNLESS OTHERWISE SPECIFIED:

- INTERPRET DRAWING PER ANSI Y14.5-1982.
- DIMENSIONS ARE IN INCHES.
- FINISH ALL PROCESSED SURFACES TO 125 RMS MAX.
- DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING.
- DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45°
- TOLERANCES (+ OR -):

DECIMAL: .XX = .03  
 .XXX = .010  
 .XXXX = .0005

FRACTION: 1/16  
 ANGLE: 1/2 DEGREE

COATING / FINISH

DESC: NONE

SPEC: NONE

FIRST USE REFERENCE:

LU10-61

SCALE: 1:2.25

WEIGHT: (LBS.)



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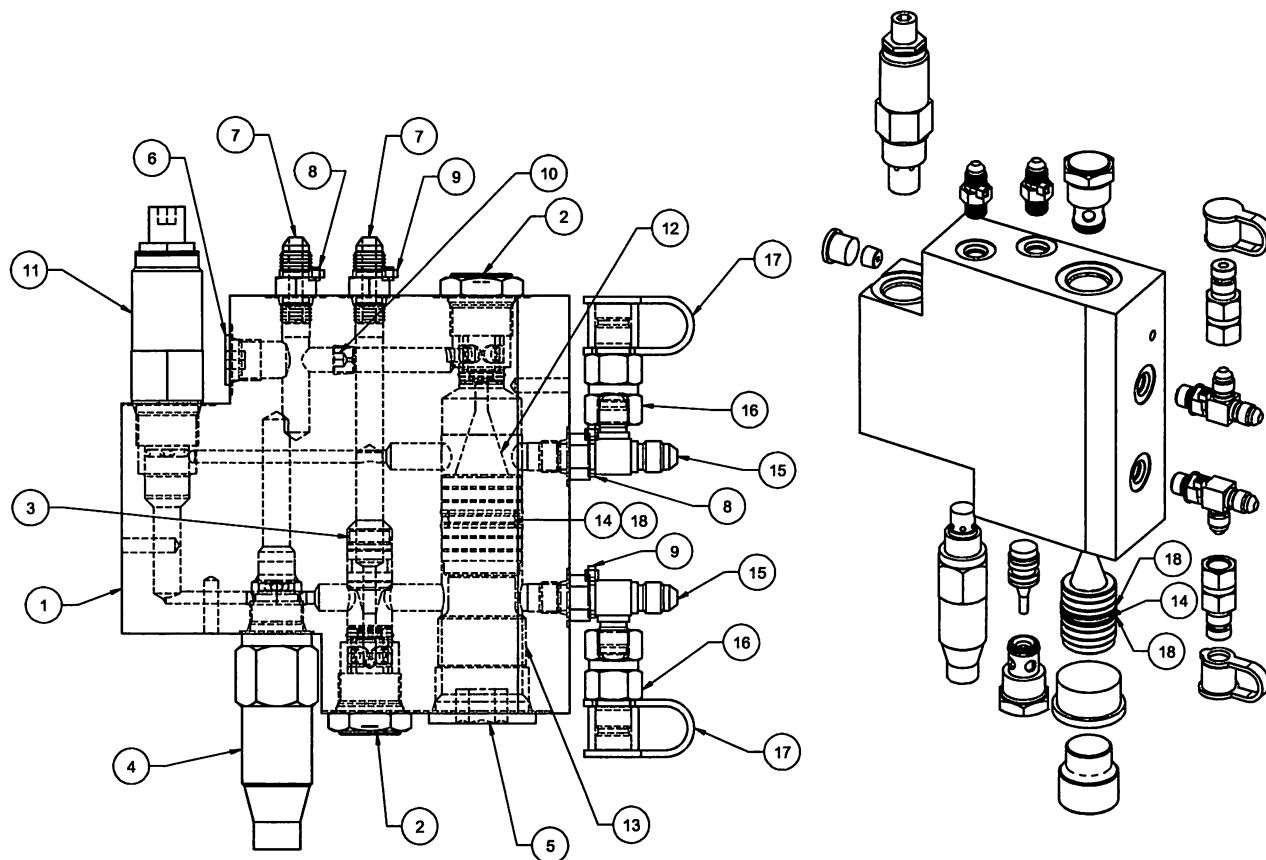
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TITLE  
 POWER/CONTROL ASSY, 24V


DOCUMENT NO.  
 274-0206

SHEET NO.  
 1 OF 1

REVISION  
 A

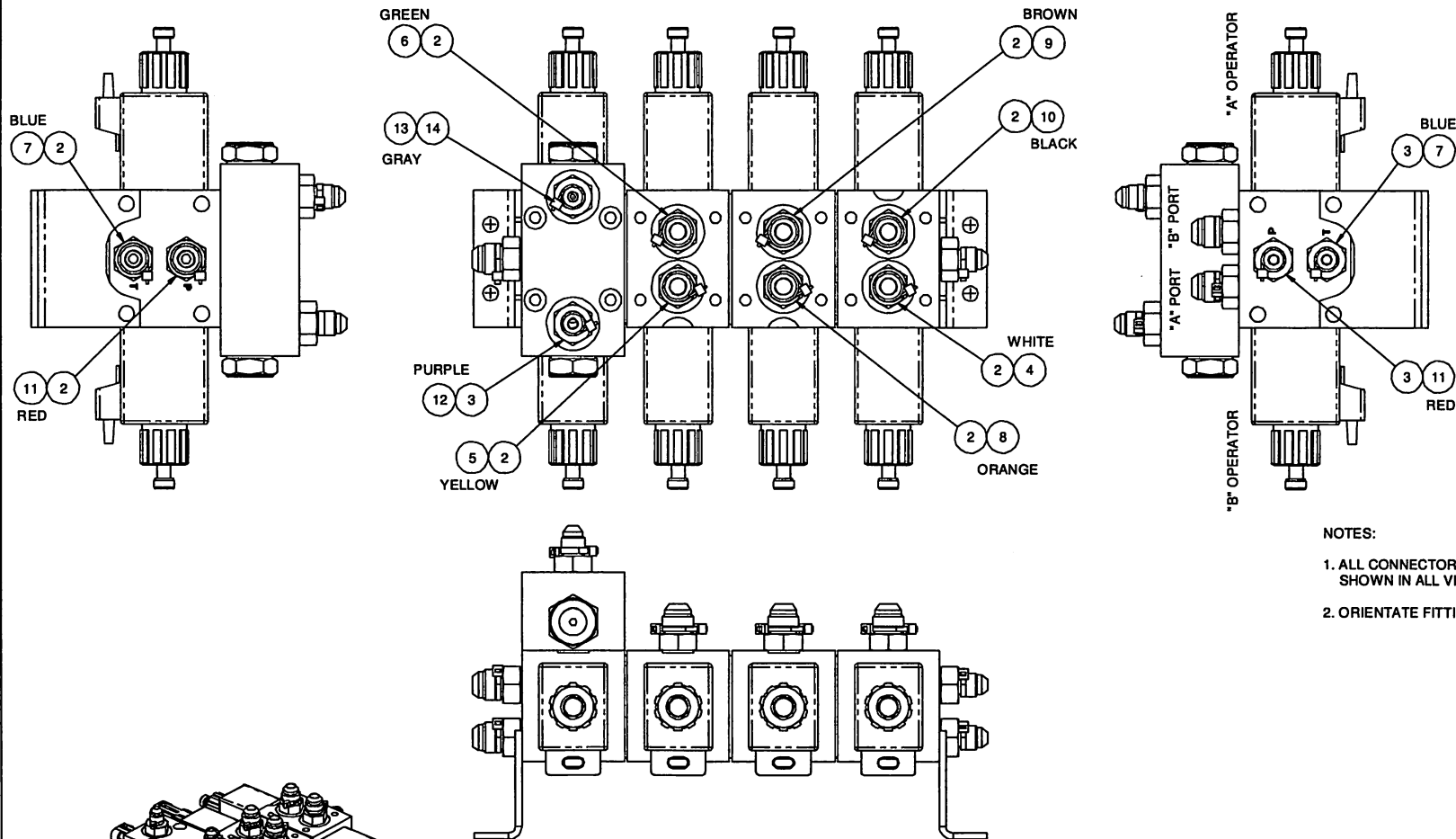


EXPLODED VIEW

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	A DIVISION OF <b>HOGAN MFG., INC.</b>		
<b>TITLE</b> MANIFOLD ASSY, LINKAGE			
<b>DOCUMENT NO.</b> D80-0614	<b>SHEET NO.</b> 1 OF 1	<b>REVISION</b> B	


Part Number	Revision	Description
D80-0614	B	MANIFOLD ASSY, LINKAGE

ITEM	QTY	P/N	DESCRIPTION
1	1	D70-9373	MANIFOLD, FLAT BAR LINKAGE
2	2	D62-1657	SOFT SEAT CHECK VALVE, CARTRIDGE
3	1	D62-1668	PILOT SHUTTLE
4	1	D62-1814	RELIEF VALVE (W/TAMPER PROOF CAP)
5	1	231-0002	STEEL PLUG
6	1	231-2804	STEEL PLUG
7	2	234-1144	HYD FITTING
8	2	436-0003	CABLE TIE, YEL
9	2	436-0004	CABLE TIE, GRN
10	1	D64-5019	RESTRICTIVE PLUG
11	1	D62-4654	RELIEF VALVE CARTRIDGE W/TAMPER-PROOF CAP (FACTI
12	1	D62-4662	PILOT SHUTTLE; 8:1
13	1	D62-4658	PILOT CHECK SPACER
14	1	D48-2984	O-RING
15	2	234-8144	HYD FITTING
16	2	230-0023	QUICK DISCONNECT FITTING
17	2	231-0001	QUICK DISCONNECT CAP
18	2	D48-9809	BACKUP RING



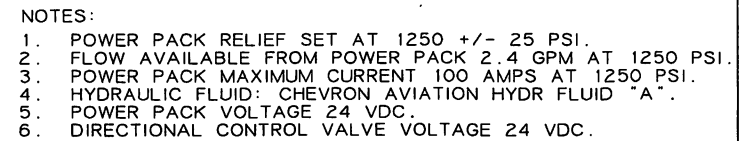
# NOTES:

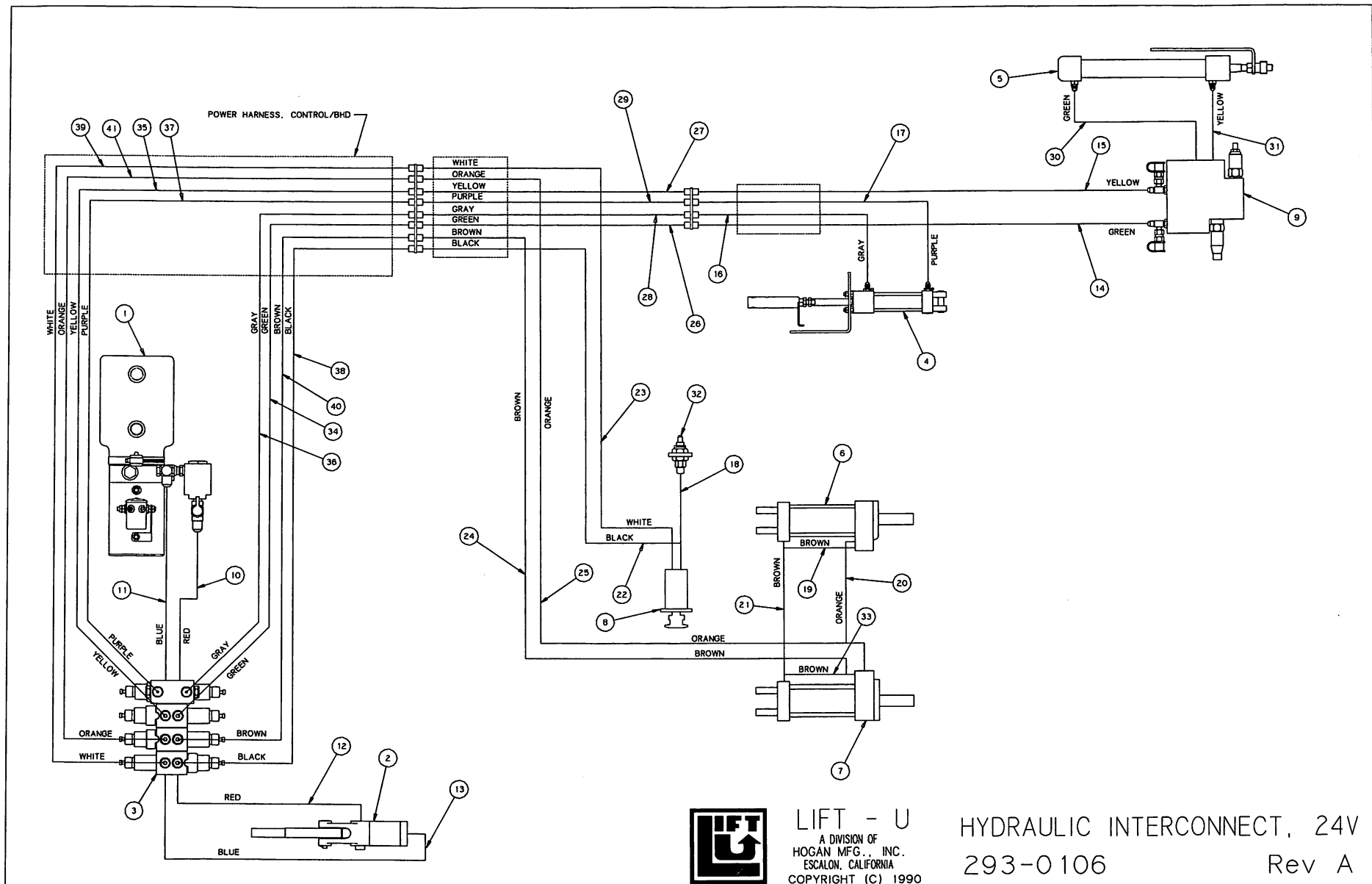
1. ALL CONNECTORS & FITTINGS ARE NOT SHOWN IN ALL VIEWS FOR CLARITY.
2. ORIENTATE FITTINGS AS SHOWN.

UNLESS OTHERWISE SPECIFIED:		COATING / FINISH	
- INTERPRET DRAWING PER ANSI Y14.5-1992. - DIMENSIONS ARE IN INCHES. - FINISH ALL PROCESSED SURFACES TO 125 RMS MAX. - DIMENSIONS APPLY TO FINISHED PART, BEFORE PAINTING. - DEBURR ALL SURFACES AND BREAK ALL EDGES .015 x 45°. - TOLERANCES (+ OR -): DECIMAL: .XX = .03 .XXX = .010 .XXXX = .0005 FRACTION: 1/16 ANGLE: 1/2 DEGREE		DESC: NONE SPEC: NONE FIRST USE REFERENCE: LU10-65 SCALE: 1:1 WEIGHT: (LBS.)	
 P.O. BOX 388 ESCALON, CA 95320 209-538-2400 A DIVISION OF <b>HOGAN MFG., INC.</b>		THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL TRADE SECRET INFORMATION OF THE COMPANY. NO PART OF IT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS ELECTRONICALLY, PHOTOCOPIING, RECORDING OR OTHERWISE, WITHOUT THE PRIOR WRITTEN PERMISSION OF HOGAN MFG., INC. THIS DOCUMENT IS LOANED FOR THE LIMITED PURPOSES STATED HEREIN ONLY, AND REMAINS THE PROPERTY OF THE COMPANY.	
		<b>TITLE</b> <b>VALVE ASSEMBLY, 24V</b>	
		<b>DOCUMENT NO.</b> <b>275-0242</b>	<b>SHEET NO.</b> <b>1 OF 1</b>
			<b>REVISION</b> <b>A</b>

Part Number	Revision	Description
275-0242	A	VALVE ASSEMBLY, 24V

ITEM	QTY	P/N	DESCRIPTION
1	1	D62-4650	BANKABLE VALVE ASSY, 24V
2	8	234-1166	HYD FITTING
3	3	234-1146	HYD FITTING
4	1	436-0002	CABLE TIE, WHT
5	1	436-0003	CABLE TIE, YEL
6	1	436-0004	CABLE TIE, GRN
7	2	436-0005	CABLE TIE, BLU
8	1	436-0006	CABLE TIE, ORN
9	1	436-0007	CABLE TIE, BRN
10	1	436-0008	CABLE TIE, BLK
11	2	436-0009	CABLE TIE, RED
12	1	436-0013	CABLE TIE, PURPLE
13	1	436-0014	CABLE TIE, GRAY
14	1	219-0046	RESTRICTIVE FITTING ASSY





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HYDRAULIC INTERCONNECT, 24V  
293-0106  
Rev A



Part Number Revision Description  
**293-0106 A HYDRAULIC INTERCONNECT, 24V**

ITEM	QTY	P/N	DESCRIPTION	ITEM	QTY	P/N	DESCRIPTION
1	1	D80-1483	HYD POWER UNIT ASSY, 24V	36	1	221-0397	HYDRAULIC HOSE ASSY, GRAY
2	1	D62-2992	HANDPUMP	37	1	221-0398	HYDRAULIC HOSE ASSY, PURPLE
3	1	275-0242	VALVE ASSY, 24V	38	1	222-0176	HYDRAULIC HOSE ASSY, BLACK
4	1	273-0067	CYLINDER ASSY, BRIDGE	39	1	222-0177	HYDRAULIC HOSE ASSY, WHITE
5	1	273-0066	CYLINDER ASSY, RAMP/BARRIER	40	1	222-0178	HYDRAULIC HOSE ASSY, BROWN
6	1	272-0088	LIFT CYLINDER ASSY, FWD	41	1	222-0179	HYDRAULIC HOSE ASSY, ORANGE
7	1	272-0089	LIFT CYLINDER ASSY, REAR				
8	1	D79-0372	DRIVE MOTOR ASSY				
9	1	D80-0814	MANIFOLD ASSY, LINKAGE				
10	1	222-0284	HYDRAULIC HOSE ASSY, RED				
11	1	222-0227	HYDRAULIC HOSE ASSY, BLUE				
12	1	221-0517	HYDRAULIC HOSE ASSY, RED				
13	1	221-0518	HYDRAULIC HOSE ASSY, BLUE				
14	1	221-0660	HYDRAULIC HOSE ASSY, GREEN				
15	1	221-0661	HYDRAULIC HOSE ASSY, YELLOW				
16	1	221-0659	HYDRAULIC HOSE ASSY, GRAY				
17	1	221-0658	HYDRAULIC HOSE ASSY, PURPLE				
18	1	222-0083	HYDRAULIC HOSE ASSY				
19	1	222-0084	HYDRAULIC HOSE ASSY, BROWN				
20	1	222-0085	HYDRAULIC HOSE ASSY, ORANGE				
21	1	222-0086	HYDRAULIC HOSE ASSY, BROWN				
22	1	222-0125	HYDRAULIC HOSE ASSY, BLACK				
23	1	222-0126	HYDRAULIC HOSE ASSY, WHITE				
24	1	222-0127	HYDRAULIC HOSE ASSY, BROWN				
25	1	222-0128	HYDRAULIC HOSE ASSY, ORANGE				
26	1	221-0348	HYDRAULIC HOSE ASSY, GREEN				
27	1	221-0349	HYDRAULIC HOSE ASSY, YELLOW				
28	1	221-0350	HYDRAULIC HOSE ASSY, GRAY				
29	1	221-0351	HYDRAULIC HOSE ASSY, PURPLE				
30	1	221-0653	HYDRAULIC HOSE ASSY, GREEN				
31	1	225-0171	HYD TUBING ASSY, GREEN				
32	1	D62-8210	STOW LATCH, CYLINDER				
33	1	222-0103	HYDRAULIC HOSE ASSY, BROWN				
34	1	221-0395	HYDRAULIC HOSE ASSY, GREEN				
35	1	221-0396	HYDRAULIC HOSE ASSY, YELLOW				

- 1 ENERGIZED WHEN BUS IS RUNNING, TRANSMISSION IS IN NEUTRAL, AND FRONT DOORS ARE FULLY OPEN
- 2 ENERGIZED WHEN BUS IS RUNNING, TRANSMISSION IS IN NEUTRAL, FRONT DOORS ARE FULLY OPEN, AND LIFT POWER SWITCH IS ON
- 3 ENERGIZED WHEN THRESHOLD SENSOR IS ACTIVATED AND LIFT IS NOT AT FLOOR HEIGHT
- 4 DISENGAGES ENGINE THROTTLE PEDAL WHEN LIFT POWER IS ON, OR LIFT IS DEPLOYED
- 5 HOLDS BRAKES ON WHEN LIFT POWER IS ON, OR LIFT IS DEPLOYED
- 6 HOLDS DOORS OPEN WHEN LIFT POWER IS ON, OR LIFT IS DEPLOYED
- 7 ALWAYS ENERGIZED
- 8 ENERGIZED WHEN LIFT IS IN MOTION
- 9 ENERGIZED WHEN BUS IS RUNNING (BUS MASTER SWITCH IN RUN POSITION)
- 10 FOR ELECTRO-MECHANICAL COUNTER: ENERGIZED DURING PORTION OF STOW CYCLE

INTERLOCKS (ITEMS 4, 5 AND 6) ARE ENERGIZED WHEN LIFT POWER IS TURNED ON IF DOORS ARE OPEN AND TRANSMISSION IS IN NEUTRAL. THE INTERLOCK RELAY WILL KEEP THE INTERLOCKS ENERGIZED EVEN IF THE LIFT POWER SWITCH IS TURNED OFF OR THE BUS IS TURNED OFF AND RESTARTED, UNLESS THE LIFT IS FULLY STOWED.

#### NOTES:

THIS SCHEMATIC IS PROVIDED TO FACILITATE LIFT/VEHICLE ELECTRICAL INTERFACE. LIFT-U ASSUMES NO RESPONSIBILITY OR LIABILITY FOR BUSSIDE CONTROL WIRING OR VEHICLE INTERLOCK DESIGN.

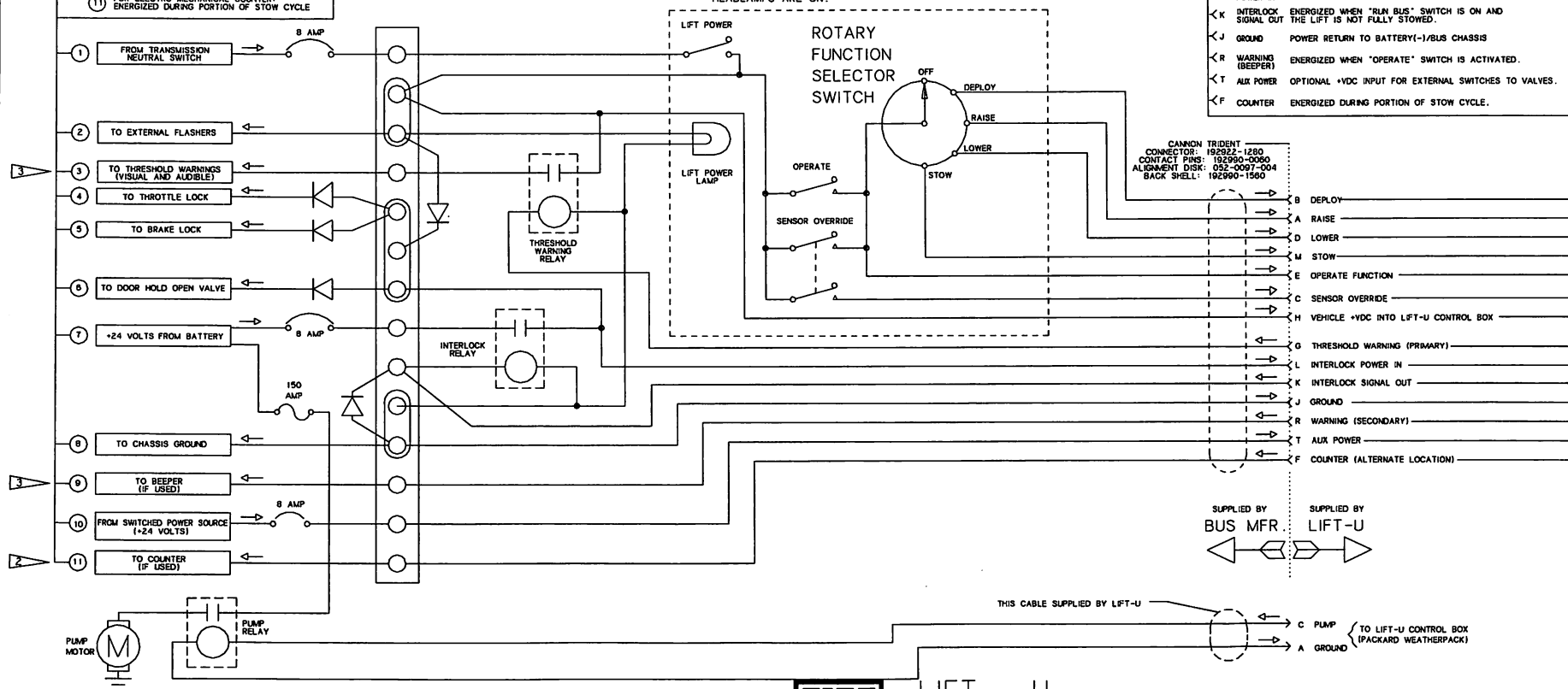
A COUNTER IS INCLUDED ON THE LIFT-U CONTROL ASSEMBLY AS STANDARD. THE COUNTER SIGNAL ON PIN F IS FOR ALTERNATE COUNTER LOCATION (i.e., DASH).

#### NOTES (cont'd):

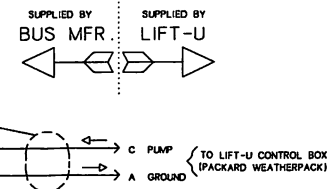
FMVSS 403 REQUIRES A VISUAL AND AUDIBLE THRESHOLD WARNING. THIS WARNING SIGNAL SUPERSEDES ALL PREVIOUS REQUIREMENTS FOR VISUAL AND AUDIBLE WARNINGS WHEN LIFT IS IN MOTION. LIFT-U CONTINUES TO MAKE AVAILABLE ON PIN R THE PREVIOUS WARNING (BEEPER) SIGNAL AS A SECONDARY OPTION ONLY. IF THE BUS MANUFACTURER ELECTS TO INCLUDE THE SECONDARY AUDIBLE WARNING, LIFT-U RECOMMENDS THE TONE INTENSITY AND FREQUENCY BE DISTINCTLY DIFFERENT FROM THE THRESHOLD AUDIBLE WARNING.

#### OPERATOR CONTROL PANEL

FMVSS 403 REQUIRES THE CHARACTERS IDENTIFYING LIFT FUNCTIONS TO BE ILLUMINATED WHEN VEHICLE HEADLAMPS ARE ON.

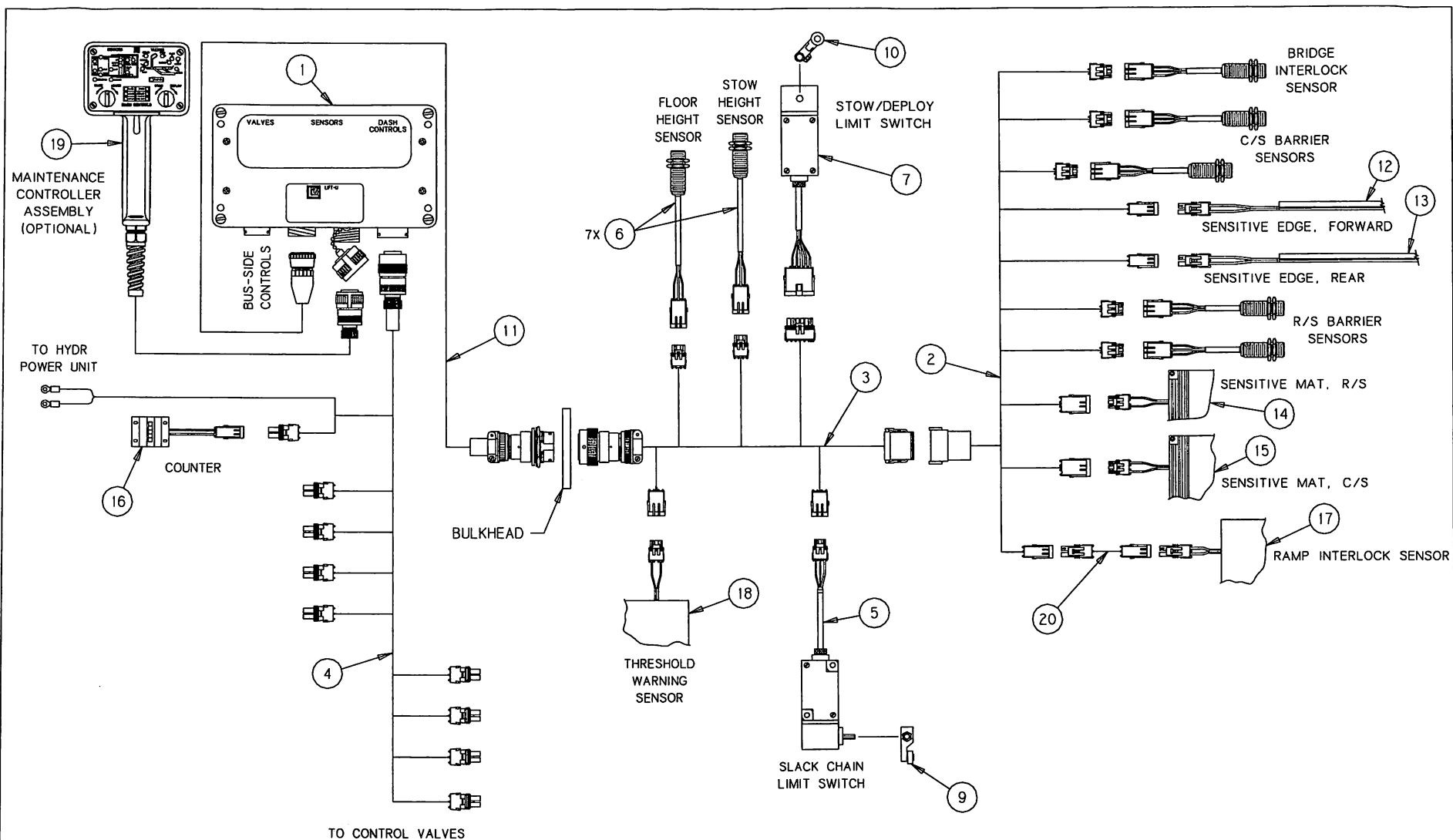


- |                        |   |
|------------------------|---|
| B DEPLOY               | ENERGIZED WHEN THE ROTARY SWITCH IS IN THE 'DEPLOY' POSITION AND THE 'OPERATE' SWITCH IS ACTIVATED. |
| A RAISE                | ENERGIZED WHEN THE ROTARY SWITCH IS IN THE 'RAISE' POSITION AND THE 'OPERATE' SWITCH IS ACTIVATED.  |
| D LOWER                | ENERGIZED WHEN THE ROTARY SWITCH IS IN THE 'LOWER' POSITION AND THE 'OPERATE' SWITCH IS ACTIVATED.  |
| M STOW                 | ENERGIZED WHEN THE ROTARY SWITCH IS IN THE 'STOW' POSITION AND THE 'OPERATE' SWITCH IS ACTIVATED.   |
| E OPERATE              | ENERGIZED WHEN THE 'OPERATE' SWITCH IS ACTIVATED.   |
| C SENSOR OVERRIDE      | ENERGIZED WHEN THE 'SENSOR OVERRIDE' SWITCH IS ACTIVATED.   |
| H VEHICLE +VDC IN      | ENERGIZED WHEN THE 'LIFT POWER' SWITCH IS ACTIVATED AND 'RUN BUS' POWER IS ON.                      |
| G THRESHOLD WARNING    | ENERGIZED WHEN THE THRESHOLD SENSOR IS ACTIVATED AND THE LIFT IS NOT AT FLOOR HEIGHT.               |
| L INTERLOCK POWER IN   | ENERGIZED WHEN 'RUN BUS' SWITCH IS ON.  |
| K INTERLOCK SIGNAL OUT | ENERGIZED WHEN 'RUN BUS' SWITCH IS ON AND THE LIFT IS NOT FULLY STOWED.                             |
| J GROUND               | POWER RETURN TO BATTERY(-)/BUS CHASSIS  |
| R WARNING (BEEPER)     | ENERGIZED WHEN 'OPERATE' SWITCH IS ACTIVATED.   |
| T AUX POWER            | OPTIONAL +VDC INPUT FOR EXTERNAL SWITCHES TO VALVES.  |
| F COUNTER              | ENERGIZED DURING PORTION OF STOW CYCLE.   |



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ELECTRICAL SYSTEM DIAGRAM, 24V  
392-0020  
Rev B



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ELECTRICAL INTERCONNECT, 24V  
393-0183  
Rev B

Part Number	Revision	Description
393-0183	B	ELECTRICAL INTERCONNECT, 24V

ITEM	QTY	P/N	DESCRIPTION
1	1	371-0304	J-BOX ASSY, 24V
2	1	331-0851	CABLE ASSY, PWR PLTFM/LIFT PLTFM
3	1	331-0857	CABLE ASSY, POWER PLTFM/BHD
4	1	331-0855	CABLE ASSY, VALVES
5	1	D10-2501	CHAIN SWITCH ASSY
6	7	D10-2495	PROXIMITY SWITCH ASSY
7	1	D10-2494	STOW/DEPLOY SWITCH ASSY
8	N/A	N/A	N/A
9	1	D90-4688	LIMIT SWITCH ARM
10	1	D90-7949	LIMIT SWITCH ARM
11	1	331-0856	POWER CABLE ASSY, CONTROL/BHD
12	1	312-0015	SENSITIVE EDGE SWITCH
13	1	312-0009	SENSITIVE EDGE SWITCH
14	1	373-0262	SENSITIVE MAT ASSY, R/S
15	1	373-0259	SENSITIVE MAT ASSY, C/S
16	1	D15-9565	COUNTER ASSY, 24V
17	1	373-0261	MEMBRANE SWITCH ASSY, RAMP
18	1	373-0263	THRESHOLD SENSOR ASSY
19	N/A	371-0305	LU10 M/C ASSY (OPTIONAL)
20	1	331-0847	RAMP INTERLOCK EXTENSION

# **Service Bulletins**